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ABSTRACT

This document reports on efforts to find technology-based solutions for the diverse challenges faced by students with disabling conditions. Twenty-three case studies describe actual scenarios experienced in the school district of Palm Beach County, Florida. For each case study, a situation is described, a challenge is identified, solutions are considered, an assessment is made to select the most appropriate system, and expenditures for the selected system are determined. The case studies deal with students with the following disabilities: arthrogryposis, cancer, cerebral palsy, educable mentally handicapped, emotionally disabled, gifted learning disabled, hearing impaired, muscular dystrophy, near drowning, post encephalitic generalized dystonia, stroke, traumatic brain injury, traumatic spinal cord injury, and visually impaired. Twelve vignettes are then presented, describing school situations that involve the use of assistive technology and challenging the reader to develop strategies to solve the problems described. A list of vendors is supplied, and school district procedures for placement of adaptive/assistive equipment for students with disabilities are included. (JDD)

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# Taming the Technology

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**The Florida Assistive Technology Impact Conference**
***F.A.T.I.C.***

**March 2, 1994**

**Janeen S. Clinton, Specialist**
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**School District of Palm Beach County, Florida**

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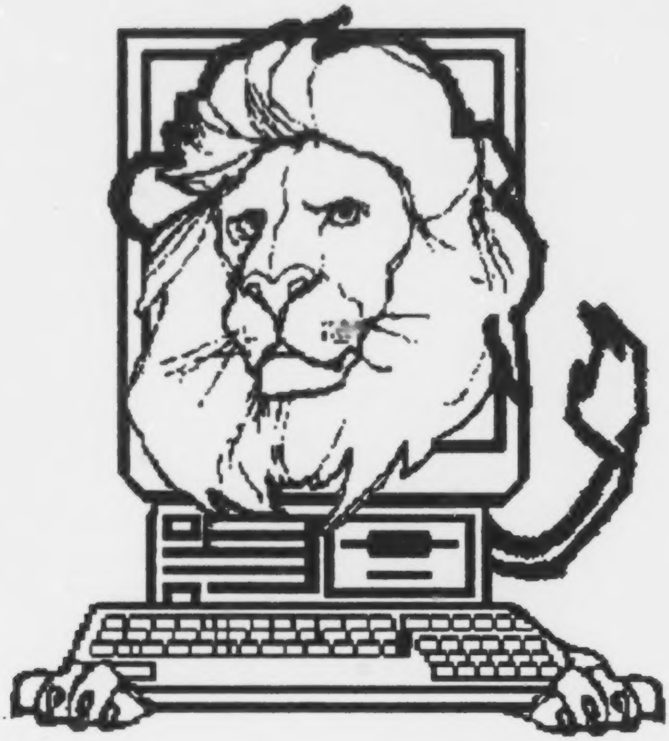
# Taming the Technology



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FDLRS/Alpha

# DEDICATION

A special Thank You to
the students,
the teachers,
the tutor companions,
the instructional aids,
the bus drivers,
the cafeteria workers,
the principals,
the administrators,
the vendors,
the manufacturers,
the media specialists,
the custodians,
the therapists,
the Technology Specialists,
the FDLRS Instructional Technology Network,
the Assistive Technology Education Network (ATEN of Florida)
the Florida Instructional Materials Center (FIMC)
the Florida School for the Deaf and Blind (FSDB)
and
the parents,

who live and work daily with
the challenges
represented in this collection.

# Preface

Each *case history* and *vignette* is based on actual scenarios experienced in the School District of Palm Beach County. The names of the students are fictional. The data is real.

The intent of this document is to focus on the efforts to find solutions for the diverse challenges faced by students with handicapping conditions. The document itself is a testiment to the trial and error often associated with these efforts. It is also a testimonial to the successes and triumphs.

The greatest frustrations, associated with some of the Case Studies, stem from several major concerns including:

-unrealistic expectations from parents and/or support providers that technology will "cure" handicapping conditions.* Assistive technology has been sold as "the great equilizer" and in some cases has lived up to the billing. But, individuals with severe physical and/or cognitive disabilities cannot be normalized by using technology tools. What does happen, and this is a significant point, is that these individuals have opportunities to maximize their abilities and to do so with less stress and frustration then those associated with their efforts with conventional tools.

-hardware and/or software that is not intuitive or transparent to the user and requires intensive, initial training for successful implementation. Students and support providers simply do not have the time to invest in long technical training sessions. Assistive technology needs to offer "plug and play" solutions whenever possible so the student can expend his or her energy on the development of literacy and computational skills.

-the presence of extensive handicapping conditions for which present technology offers no satisfactory solutions. Present technologies are significantly better then traditional tools which often cannot be used at all, but the hope remains that the ingenuity and inventiveness of people will result in continued development of assistive technology tools. With that in mind, we offer a special Thank You and continued challenge to:

The developer of **IntelliKeys**, a wonderful, reasonably priced, programmable, plug and play, touch-sensitive extended keyboard.

The developers of **Co:Writer** and **Write:Outloud** for making an easier-to-use word prediction program.

The developers of the **Jelly Bean Switch** for adding color and fun to a tedious task.

The developers of the **Braille n' Speak** for creating a versitile, portable, compatible and user-friendly device for the blind.

The developers of the **DynaVox** for creating a dynamic, programmable, communication display that eliminates the need for making time-consuming overlays while creating opportunities for spontaneous communication.

The developers of the **Reading Edge** for bringing spoken text within financial range for non-reading and blind individuals.

The developers of **Ke:nx** for making an easy-to-install, versatile, transparent and flexible, multi-purpose access tool.

The developers of **Windows** and **Macintosh** computers who are *beginning* to include simple access solutions in their operating systems.

The developers of the **Scholastic** WiggleWorks: Beginning Literacy System software program that INCLUDES voice output and switch access as elected, user alternatives.

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*It is necessary to qualify the term "expectations." Parents and educators who maintain high expectations for their children and students are often rewarded with better performance. This statement does not dispute the need to maintain those high standards. It does address expectations that exceed the abilities of a young person and create a climate of stress that can, and does, result in artificial grades and the perception of academic progress that is not justified.

*This raises a key question: **How do you grade a severely handicapped student, in an inclusive environment,**

who does only a small percent of the work expected of his/her peers;

who has the assistance of an extensive support system not available to his/her peers; and

who takes significantly longer to produce less work then his/her peers?

*According to the dictates of the Individual Education Plan, the student may earn A's, but according to the standards expected of his/her peers, the student may be "failing."

*The primary purpose of public education is to prepare each generation for employment and civic responsibility. Technology is opening new opportunities for individuals with severe/multiple handicapping conditions, however, the demand for individual productivity is still a realistic indicator for employability and as such, must be considered a qualifying factor. There are different standards of "success" and it is essential that all care givers maintain a realistic perspective of the progress achieved by each individual student.

## Note

Prices for hardware and software listed under **EXPENDITURES** in each case history are not the current market price. They are the actual prices paid at the time of purchase. The costs do include educational discounts available from many vendors and manufacturers.

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## Case Study 1

### *Cerebral Palsy*

## SITUATION

Kim is a senior in a regular high school. She is in advanced placement courses. She does not have any ESE classes in her schedule although she is listed as ***physically impaired***. Kim does have an Individual Education Plan that identifies course modifications appropriate for her disability. She receives speech, occupational and physical therapies on a consult basis.

Kim is a good candidate for college although her present interest is in modeling. She entered the public school system when she reached the 7th grade. Prior to that time, she received her education in private schools.

Kim has a severe case of ***cerebral palsy***. She uses an electric ***wheelchair*** for mobility. Kim ***lacks the fine motor coordination*** needed for handwriting or keyboarding. Even single finger typing is difficult because Kim lacks the control to accurately and consistently strike a desired key.

Kim's ***speech is intelligible but is very slow and labored***. A **tutor companion** is assigned to Kim to help with mobility, note taking, bathrooming, eating and written expression.

## CHALLENGE:

Kim needs a computer system with adapted input that has sufficient **speed** to keep up with her intellectual ability. A desired outcome is to create opportunities for **less dependence** on the tutor companion for academic work.

## SOLUTIONS:

Kim was provided with a DOS based **laptop** with a **word processor** combined with **word prediction**. A **printer** was also provided. A variety of input methods were evaluated despite Kim's strong preference to remain a **direct selector**. Kim worked well on the TASH Mini-keyboard and alternated between using that and the standard keyboard.

## ASSESSMENT:

Kim found that the computer system was too slow for her to use effectively in class. Kim continued to rely on the tutor companion to take notes and complete written assignments. She did take the laptop computer home where she used it to complete written homework.

Kim had also been provided with a Penta switch. After trying the device she chose to return to direct selection, single finger input.

Kim has expressed her opinion that she values the technology and understands that it affords her opportunities to produce written expression independently. She remains frustrated by the slowness of the system which, even with word prediction, cannot maintain the pace at which she produces thoughts.

Kim tried an early version of voice recognition software for input. The effort was not successful. Kim's speech pattern had false starts and "breatheness" which resulted in many computer errors. Frustration mounted and Kim did not always correct the misinterpretations which eventually lead to a corruption of the speech files.

Kim would like to try a newer version of voice recognition. A system has been ordered to enable her to have the opportunity to test the effectiveness of the technology as a compensating tool.

## EXPENDITURES

### FIRST SYSTEM

| | |
|---|---|
| Tandy laptop 2810 | $1749.30 |
| DMP 300 printer [Tandy] | $499.00 |
| Scan and Morse Code Keyboard Emulator software [Words+] | $1195.00 |
| Penta Switch [Exceptional Computing] | $150.00 |

### SECOND SYSTEM - 1994/95

| | |
|---|---|
| Mac PowerBook 160 with 8MB RAM 40 HD, modem | $2421.00 |
| ImageWriter printer [Apple] | $388.00 |
| Co:Writer [ACS] | $290.00 |
| Claris AppleWorks [Apple Corp.] | $169.00 |
| Dragon Dictate | $999.00 (install, train) |

# Case Study 2

## *Access to an Integrated Learning System*

### SITUATION

The School District recently approved an ***Integrated Learning System (ILS)*** that will be implemented district-wide in every 2nd through 8th grade. Each school will be wired for a Local Area Network (LAN) that will enable e-mail and bulletin board functions as well as printer sharing. In addition to the ILS, versions of networked software will be stored on the file server with a master menu available at each student station for easy access to the programs. Each student will log into the system which tracks performance and prints extensive reports on individual and class progress.

### CHALLENGE:

The challenge is to ensure that **"all" students have access** to the ILS.

### SOLUTIONS:

1. Get the complete configuration of the hardware system that will be used for the ILS. (See EXPENDITURES)

2. Get the scope and sequence of the ILS software.

   [See attachment - Software scope and sequence for Computer Curriculum Corporation (C.C.C.) used by the School Board of Palm Beach County.]

3. Try different adaptative solutions with the ILS set up to ensure compatibility and to establish the install configuration.

   [Note: Once an install configuration is created, make a master disk that contains the configuration. Share the disk with those individuals who will be supporting the adaptation(s).]

| **Impairment** | **Potential solution** |
|---|---|
| visually impaired | - screen magnifier software<br>- screen reading software for text |
| blind | -not able to access independently<br>-input for ILS varies from mouse to keyboard so user cannot determine "where" they are on the screen |
| physically impaired | -keyboard emulator<br>-IntelliKeys expanded keyboard<br>[Note: requires Access DOS to activate the |

| | |
|---|---|
| | mouse]<br>-switch<br>-mouse emulator<br>-different style of mouse or trackball<br>-switch access |
| hearing impaired | -dual headsets with Y connector<br>-speakers if headphones interfere with hearing aids |
| cognitively impaired | -appropriateness of the software |

4. Review district implementation plan to ensure the following:

Will "full-time" ESE students have hardware/software in their classrooms?

Will "part-time" ESE students have access to the ILS during the time they receive ***primary instruction*** in the subject?

Does the ILS present subject content in a manner that is conducive for learning by an ESE student?

Do the skills progress in difficulty in small increments?

Are students given the opportunity to apply skills reviewed in the ILS?

Are ESE students advancing through the levels of the ILS or do they get "stuck" at specific points?

Do ESE students demonstrate the ability to transfer skills learned in the ILS to other environments and activities?

Will the district purchase alternative software for ESE students for whom the ILS is not appropriate?

Will the district use general education funds to purchase assistive devices to adapt the ILS hardware?

## EXPENDITURES

| | |
|---|---|
| AST ILS workstation computer (bid) [Computer City] | $1,863.74 |
| Multimedia external sound system [Computer City] | $52.92 |
| Power switching system | $53.45 |
| 24-pin 80 column printer | $322.95 |
| 13' printer port cable | $6.99 |
| Internal CD ROM | $456.33 |
| Computer Curriculum Corp. ILS | county bid |

# Case Study #3

## *Cerebral Palsy*

### SITUATION

Craig is a 13 years old student in middle school. He has been enrolled in the public schools since kindergarten. He has always been placed in regular or advanced classes. Craig has normal hearing and vision. He has a rich receptive vocabulary and functions on grade level.

Craig has ***cerebral palsy***. Athetoid movements ***interfere with his gross and fine motor*** coordination. If positioned correctly, Craig has use of his arms and hands for some fine motor activities but does not have sufficient coordination for handwriting. He does not cross the midline easily with either hand. When manipulating objects, Craig's hands often fist preventing finger use. He uses a ***wheelchair*** for mobility. He has a ***tutor companion*** to assist with academic work.

Craig has ***decreased oral muscle tone*** and cannot control tongue and jaw movements resulting in ***limited speech intelligibility***. During speech, Craig fails to grade release of the muscles used to control air flow resulting in weak and short sound production. He cannot control refined tongue top movements and consistently omits sounds and final consonants such as /t/, /d/, and /l/ in words. He has adequate facial control to vary expressions and communicate general emotions. Craig receives speech, occupational and physical therapies at school. While in elementary school, Craig also received private speech and physical therapies.

Craig participated in a Communication Systems Evaluation Center (CSEC) evaluation when he was six years old. The recommendations included use of an AAC device, Morse code and switch access for computer input. Single finger pointing was also listed as an input option.

### CHALLENGE

To provide a computer and/or AAC system that would enable Craig to work **as independently as possible** in a regular [or advanced] academic setting.

To reduce the need for a tutor companion to assist Craig with academic work.

To provide a system with sufficient **speed** to keep up with Craig natural **written output**.

To provide a system to supplement, as needed, Craig's **oral communication**.

### SOLUTIONS

Throughout all of his school career, Craig has been assigned a Tutor Companion who has assisted with class work. A system has not yet been placed that has the capability of helping Craig keep up with the pace of a regular [or advanced] academic program.

In first grade, Craig used a communication encoded book (manual system) that used number, letter, and color coding but he preferred to use his voice. He was aware that others could not always understand him and used different strategies to repair messages including:

-shortening his message without compromising the meaning.
-soliciting an interpreter such as his brother.
-using the initial or final letter sound.
-giving similar qualities or attributes.

Craig still resorts to the manual system when his electronic devices are not working.

In 1988, an Apple IIe with Adaptive Firmware Card, Echo Speech Synthesizer and ImageWriter printer were placed for Craig's use. Therapeutic furniture was also placed in his classroom. The Apple IIe with AFC was state of the art at the time. A major concern that developed was the necessity of isolating Craig from the rest of the classroom because the Apple IIe, on a desk, had to be placed in a corner of the room near a plug. When using the computer, Craig had to sit with his back to the class. He could not see his classmates and thus could not interact with them. Some of his teachers in elementary school tried placing the computer in different locations to overcome this concern. The Apple IIe did allow Craig to independently produce his own written expression but because input was often too slow, Craig also dictated written work to his tutor companion. For example, dictation was common with spelling tests so that the teacher did not have to make all the students wait for Craig to finish typing a word. Craig's tutor companion did an excellent job in determining when it was appropriate to let Craig dictate his answers and when he should work independently on the computer.

A TouchTalker with Minspeak software, per the CSEC recommendation, was placed for a short time. Craig preferred to rely on his speech and had developed literacy skills so that a text-based system appeared to be more appropriate.

In 1991, Words+ scanning WSKE software and a DecTalk Speech Synthesizer were mounted with a Quick and Easy Mount on Craig's wheel chair. The RealVoice interfaced with a Tandy laptop with printer. This system never worked as intended. The numerous pieces of the system, including the "soft key," the external speech synthesizer and DOS based software complicated the provision of quality training and the pieces often needed repair.

There were serious problems with the "soft key" which plugged into the joystick port and was attached to the laptop with velcro. The autoexec.bat file for the software was corrupted numerous times. Each time, the laptop had to be picked up at school, brought into the district office for reconfiguration, then returned to the school. Turn-around-time varied anywhere from three days to a couple of weeks.

After repeated problems with the laptop, including a repair that took a couple of months, the DOS based computer was pulled and replaced with a Macintosh laptop adapted with a Ke:nx. The laptop was set up with Co:Writer and Write OutLoud software and dropped off at the school in August, 1994. A letter from the school requested additional training on the new computer be arranged for service providers.

## ASSESSMENT

Craig presents a real challenge to individuals working in adaptive technology. Although he has had access to a high tech environment since his enrollment in public school, a solution has not yet been found that can keep pace with Craig's intellectual development. Craig chose to discard the AAC devices and Morse code. He tried several switches before settling, most recently, on a Jelly Bean switch activated by knee movement. He has experienced an inordinate amount of equipment breakdown causing delays of several months each time the device had to be serviced or repaired.

Although Craig had the same tutor companion throughout elementary school, training has been a critical issue. Regular site visits were needed to maintain Craig's tech environment. The Tandy laptop, adapted with WSKE software proved to be too difficult to maintain in the field. The software setup had to be reinstalled several times, the key had to be sent in for repair, and ultimately, the computer harddrive crashed.

When Craig was ready for middle school, he transferred to a school for all 6th graders, before progressing on to a middle school for 7th and 8th graders. This meant that within one year, two sets of support personnel had to be trained. The complaint that "additional, timely inservice" was needed was a direct result of this scheduling. The support personnel at the new middle school HAD been inserviced extensively in comparison to support personnel for other students in the district, but they had not reached a comfort zone in maintaining the environment for such a tech-dependent student.

Craig's tutor companion also made the decision to not move with him to middle school. She felt it was important that he interact with different people to loosen the bond and dependence he developed by close proximity and familiarity with a single support person. Her decision was admired but, it did mean that training had to be initiated with personnel unfamiliar with Craig's support technology.

Despite difficulties with the technology, Craig has continued to experience success in regular and advanced placement courses with the assistance of a tutor companion. It is still hoped that, as technology continues to develop, a faster, more efficient and intuitive system will be invented that will allow Craig to fully express his diverse knowledge independently.

## EXPENDITURES:

### FIRST SYSTEM - 1988

| | |
|---|---|
| Adaptive/therapeutic furniture [Rifton] | $403.00 |
| TouchTalker | $0.00 |
| Apple IIe | $974.40 |
| ImageWriter printer | $493.80 |

### SECOND SYSTEM - 1991

| | |
|---|---|
| Tandy 1000LE 20 HD laptop | $2495.00 |
| Scan and Morse Code software [Words+] | $1210.00 |
| Quick & Easy Mount [Adaptive Communication Systems] | $625.00 |
| Penta switch [Exceptional Computing] | $150.00 |
| Cross switch | |

| | |
|---|---|
| RealVoice Stand Alone (male) [ACS] | $1595.00 |
| Master Keys | $995.00 |
| DEC Talk Speech Synthesizer | $1611.25 |
| RealVoice mounting plate | $40.00 |
| Tandy laptop repair | $369.83 |
| Plate for Quick & Easy Mount was lost/device replaced | $595.00 |

## THIRD SYSTEM - 1994/95

| | |
|---|---|
| Macintosh 520C 4/160 | $2,462.00 |
| 8 MG expansion memory kit | $398.00 |
| Ke:nx [Don Johnston] | $780.00 |
| StyleWriter II | $269.00 |
| MultiVoice speech synthesizer [Don Johnston] | $1,250.00 |
| Jelly bean switch | $42.00 |
| Co:Writer [Don Johnston] | $99.00 |
| Write OutLoud [Don Johnston] | $299.00 |

# CASE STUDY #4

## *Gifted/Learning Disabled*

### SITUATION

Jay was referred for a tech eval during the Spring of his 8th grade year. He had been accepted into the district TAP program and his mother was concerned that his grades would suffer if he didn't have some assistance with written expression/communication. Jay is ***Gifted/Learning Disabled.*** His long-term goals include attending college with a possible major in research and development related to public relations.

Jay had developed a system of ***writing in code.*** He generally understood what he had written but no one else could read it. When he read his writing, Jay filled in missing words and sentence patterns. His verbal expression was very advanced. His written expression however, was not commensurate with his verbal ability.

In elementary and middle school, Jay's Gifted teachers oversaw ***modifications*** to his work. These included using NCR paper so that another student could take notes and give Jay a copy, giving oral tests, using a tape recorder to tape lectures, reducing the size and number of assignments, using a calculator for math and using a computer for written assignments.

### CHALLENGE

Let Jay pilot an advanced, pen-based, portable computer system that he can use to take notes in class and **produce written class and homework assignments**.

### SOLUTIONS

Jay was asked to pilot a very sophisticated laptop computer that has the ability to recognize handwriting. The word processing software was complimented with a spell checker and thesaurus. It was hoped that Jay would be willing to carry the laptop to class to see if it was a successful tool for note taking. Meanwhile, he was encouraged to take a class in keyboarding to improve his typing speed and accuracy.

Jay and his mother were interviewed prior to the placement of the computer. They were both present when the laptop was actually placed. Jay was cautioned to be honest in his assessment of the effectiveness of the laptop as a tool in his academic work. His mother was cautioned that, despite the support and motivation evident in the family, peer pressure would be a factor in Jay's willingness to integrate the laptop into his academic/daily routine.

### ASSESSMENT

Jay is using his Compaq both at home and at school. His use at school is confined to those situations where he feels it will be helpful. The greater use is in the home environment where he completed "medium" to "large" written assignments.

Jay did break his wrist in the Fall which limited his typing for six weeks however, he is back on schedule at this time and is maintaining straight A's in all his courses. He is presently being considered for the International Baccalaureate program.

## EXPENDITURES

| | |
|---|---|
| Compaq Concerto 486SL 33Mhz 250MD [ComputerLand]<br>(will use printer at school) | $2,360.00 |

# CASE STUDY #5

## *Post Encephalitic Generalized Dystonia*

### SITUATION

Simeon is a 9th grade student in full-time ESE. Simeon has been diagnosed with ***Post Encephalitic Generalized Dystonia causing an abnormal gait***. The **pain threshold** of his condition causes Simeon to be in constant motion. He moves from standing to kneeling, rolls on his side to a prone position, comes back onto his knees or all fours, sits, then stands, and so on. The cause of Simeon's condition is ambiguous. He developed normally until he was 3 years old when he had an illness that caused a high fever. Simeon was in Haiti at the time, and details of the illness are not known. Shortly after the illness, Simeon's mother passed away and Simeon came to the United States to live with his father.

Simeon's condition made it impossible for him to produce much ***written work***. His best successes came when he used his teacher's computer. It was observed that Simeon was able to stay upright for a longer period of time, he became less frustrated and completed more work while using the computer.

### CHALLENGE

To provide Simeon with a computer system housed in a recessed console so Simeon can lean on the console if needed. The computer will help Simeon develop some of the behaviors observed when he had access to his teacher's computer. **Comfort** and **easy access** are the prime consideration. It is understood that Simeon has better and worse days that affect his ability to perform.

### SOLUTIONS

A high end computer system for the sole purpose of helping Simeon produce some written language while positioned as comfortably as possible. A detached keyboard was an important consideration. Recessing the monitor so Simeon could lean on the table and look down at the screen as suggested. It is not expected that any solution will be adequate. Simeon's pain threshold is so great that the best solution is to provide something that makes input as easy as possible.

A high end system was selected so that additional modifications and adaptations could be interfaced with the system at any time. Presently under consideration, is an effort to try voice recognition input with Simeon as soon as a wireless mike can be tested with the system.

### ASSESSMENT

Simeon has had greater success in doing academic work since he started working on the computer. He likes to work at the computer and educators feel it also distracts him from thinking about his physical pain.

Simeon's teacher is also the athletic director for the school. Athletes are frequently in him room and he has encouraged them to develop a friendship with Simeon. He has also scheduled Simeon to eat lunch with different team members. These strategies, combined with the placement of the computer for academic work, have created a workable solution for Simeon.

Voice recognition with a wireless mike will be tried with Simeon during the second semester so that he has input alternatives depending on how he feels physically.

## EXPENDITURES

### FIRST SYSTEM -1993/94

| | |
|---|---|
| Hewlet Packard LaserJet 4 [ComputerLand] | $1213.85 |
| Hewlett Packard Scanner [ComputerLand] | $621.72 |
| Recessed monitor console table | $330.60 |
| Zenith-400+ 486 SX/33MHz w/ 170 HD, 8MB RAM | $1,608.00 |
| CD ROM multimedia discover solution [ComputerLand] | $500.00 |

### SECOND SYSTEM - 1994/95

| | |
|---|---|
| Voice recognition with wireless mike | $995.00 |

## CASE STUDY #6

*Traumatic Spinal Cord Injury - quadriplegic*

### SITUATION

Shari is a 2nd grade student who has just entered the school district after moving to Florida from New Jersey. She is now living with her father and his wife who have a new born baby. Shari's birth-mother passed away in May, 1994.

Shari is two years post-trauma from a ***spinal cord injury*** suffered in a traffic accident in New Jersey. Shari is a ***C-1 quadriplegic***. She breathes through a respirator, is tube fed and ***speaks in a whisper***. For the past two years, Shari lived at a rehab center in New Jersey. She learned to control her wheel chair and her Macintosh computer with a ***chin switch***.

Shari was initially placed on Hospital/Homebound but her parents also enrolled her in a regular 2nd grade. By October, 1994, she was attending school half day. In December, 1994, she began attending school full time. A ***nurse***, assigned to Shari on day duty, accompanies Shari to school to monitor the respirator. The school district pays for the nurse while Shari is in school. A ***tutor companion*** has been provided to assist with academic work.

### CHALLENGE

Shari has her own **adapted Macintosh** computer at home. A similar set up will be replicated for her educational needs in her classroom so that Shari can **perform academic tasks commensurate with her cognitive ability**. A prime consideration is to provide equipment that will enable Shari to develop as much **independence** as possible. **Environmental controls** will also be tried.

### SOLUTIONS

The first consideration was to get Shari an electric page turner so she could independently turn the pages of a book. Shari loves to read and the page turner allows her to pursue this interest without the need for constant assistance.

The second consideration was to provide an adapted Mac for Shari to use at school. Since she is already familiar with the Mac environment, this is a natural step to enable her to perform academic work.

The Computer Curriculum Corporation donated the Mac CD version of their integrated learning system (ILS). The C.C.C. DOS/Windows software is in use in every school in the district in grades 2-8. The software reviews math and English skills in progressive sequence.

### ASSESSMENT

The first electric page turner that was ordered was returned for a more reliable model. Once set up at Shari's home, it was immediately evident that a frame needed to be built so that the page turner could be tilted at an angle in line with Shari's vision. Shari has very little movement in her neck and she is presently positioned at a reclining angle in her wheel chair.

The Mac for Shari's classroom is on order. Meanwhile, staff are working with her Mac at home to customize scans for her to access the Computer Curriculum Corporation (C.C.C.) software using a chin switch. Shari is accessing her home computer successfully. She, however is resistent to using the technology.

## EXPENDITURES

| | |
|---|---|
| 4600 Next page Page Turner [ACS] | $3,030.00 |
| X-10 environmental control [ACS] | |
| Power Macintosh 6100/60 AV teacher solution | $2,739.00 |
| Co:Writer [Don Johnston] | $99.00 |
| Write OutLoud [Don Johnston] | $299.00 |
| Ke:nx 3.0 [Don Johnston] | $780.00 |

## CASE STUDY #7

### *Hearing Impaired*

*Herman Matos, Specialist, SNAP*

## SITUATION

The Special Needs Assistance Program [SNAP] funded through 316 monies from the Department of Adult, Community and Vocational Education looked for ***opportunities to cooperate with ESE*** personnel in the placement of ***technology*** that could be used to train the ***low incidence population for inclusion in Technology Education*** classes.

## CHALLENGE

To facilitate the vocational mainstreaming of special needs students who are hearing impaired by funding assistive technology that would make a significant difference for sensory impaired students. The same technology is available for use by other regular vocational students within the school center and/or by other ESE and/or vocational teacher(s).

It was surmised that the outcome would include **creation of a group of school based trained personnel to provide technical support for assistive technology**, and that there would be an increase in the use of the technology in multiple settings.

It was necessary to identify **a site with collaborative ESE/vocational teachers**, and **school administrators committed and willing to support** their efforts. This proved to be a significant challenge since many high schools become departmentalized and are not accustomed to interacting inter-departmentally. The project also tried to identify **teachers committed** to following through with the assistive technology plan because they can be an effortless pleasure to work with and offer many rewarding experiences. On, the other hand, experience demonstrated that unwilling teachers could sometimes pose an impossible barrier to progress and successful outcomes.

After a site was selected, it was necessary to **identify the appropriate assistive technologies** for use in the classroom. A consideration in the selection was the expandability of the hardware in preparation for future upgrades.

## SOLUTION

The selected Hearing Impaired units were set up with an IBM computer workstation with a CD ROM drive, Grolier's Multimedia Encyclopedia software, fax/modem, IBM Phone Communicator, a digital Canon Zapshot camera and ComputerEyes R/T capture board, Microsoft Works and a 24-pin dot matrix printer with paper.

The hardware and software was initially purchased with Carl D. Perkins Applied Technology Grant dollars. Later, IDEA funds were used to supplement the Perkins monies. The features of various products were evaluated for potential benefit to the program and every effort was made to encourage the teacher receiving the technologies to have an active role in the selection process.

When the technologies were placed, measureable goals and objectives were written in a concise format. Reasonable timelines were set to review and evaluate the model. An important factor in setting the timelines was providing sufficient time for the teacher(s)/student(s) to become acclimiated to the devices.

A support network remaind a necessary feature of this type of model. The level of technical assistance varied considerably from site to site. Some teachers liked their hands held, while others took personal ownership of their project and resented excessive intrusions.

## ASSESSMENT

The project was successful in meeting the primary goal of facilitating the vocational inclusion of hearing impaired students. The assistive technology was mastered and utilized by ESE teachers, hearing impaired students and vocational teachers at the selected school sites.

Palm Beach County is known for its transient populations. Teachers who move from school to school or out of district, effect training schedules and the collection of measurable data. This factor became even more apparent when training efforts were directed at one individual in a school. If that teacher moved, the implementation plans experienced a major setback. Two sets of teacher in both of the selected pilot sites had a turn-over in staff. That meant that training, goal setting and project outcomes had to be started over from the beginning. A great surprise however, was the fact the the students with hearing impairments helped to train the new teachers with hands-on demonstrations. **This was the most significant and positive sign that the investment of resources in the project was worthwhile.**

To ensure teachers had reached a "comfort zone" with the new technologies, it was sometimes necessary to allow them to take the equipment home.

Every effort was made to avoid technical solutions or technologies that were labor intensive. Teachers and students were already unindated with intensive curriculums and did not have the luxury of spending exorbudent amounts of time learning how a program or computer operated. The technologies were a tool that needed to quickly get the user to the task that needed to be accomplished.

The use of the Cannon Zapshot to create digital graphic images for hearing impaired students was very successful. Images were taken of vocational objects that represented concepts and vocabulary. These were organized into a picture storyboard to train the students with hearing impairments. There was a noticeable increase in spontaneous communication between the hearing impaired students and an increase in their self-esteem.

The vocational curriculum has been evolving to Technology Education so the inclusion of the selected assistive technology proved very successful. For example, the IBM PhoneCommunicator and the modem were very popular. The modem allowed the students to express themselves by leaving e-mail messages to other students and to people around the United States via telecommunications. Since telecommunications is a visual experience, it proved to be both educational and entertaining for the students with hearing impairments. Using the medium, the students were able to ask their teacher questions about their computer experiences. This made the student's language acquisition relevant to the real world.

The CD multimedia encyclopedia provided the opportunity for the teacher of the hearing impaired to utilize the computer workstation as an instructional tool. The students considered the use of the computer as fun. Little did they realize that it was the change in medium that had faciliated their change in attitude and behavior toward learning. That positive student change also made a believer out of some of the initially skeptical teachers.

The technology did provide a head start to prepare students with hearing impairments for their vocational classes. The students entered the classes feeling more confident about their participation because they had a language/picture base of familiar objects to which they could relate.

A break-in at a third site resulted in the theft of the equipment. The students were very upset but, despite concerted efforts, it has taken over a year to replace the original equipment.

## EXPENDITURES

| | |
|---|---|
| Computer workstation | $1,169.00 |
| 15" SVGA monitor | $489.00 |
| CD ROM drive and SoundBlaster | $479.00 |
| Fax/modem | $139.00 |
| 4 MB SIMM supgrade to 8MB RAM | $184.00 |
| IBM Phone Communicator | $600.00 [app] |
| Canon Zapshot with accessory kit | $1,450.00 |
| ComputerEyes | $299.00 |
| Dot matrix printer | $322.95 |
| MicroSoft Works 3.0 Windows | $75.00 |
| Winfax Pro 4.0 | $87.00 |
| Grolier's Multimedia Encyclopedia (with CD ROM) | |

# CASE STUDY #8

## *Gifted / Learning Disabled*

### SITUATION

A unique student offered a unique opportunity. Zach is ***Gifted/Learning Disabled***. He is also the product of a family immersed in computers. Zach is in 9th grade. He is a highly motivated student but ***cannot read.*** To compensate for his learning disability, Zach developed his own strategies. To write reports or do assignments, Zach would dictate his answers into a tape recorder. Then, he would listen to the tape and write down the words using a ***Franklin Speller*** for assistance. At home, Zach used a word processor with spell checker. His Individual Education Plan [IEP] includes a modification for time allowed to complete written assignments.

Zach is registered with the ***Lighthouse for the Blind*** to receive taped textbooks and other educational material. He bought his own copy of one required-reading, English novel on tape so that he could keep up with class assignments. He spent an overage of 2-4 hours a night catching up on assignments normally completed by students in class.

Zach's teachers were so impressed with his efforts and attitude that they requested a tech evaluation to see if there was any easier and faster way for Zach to complete class assignments without spending tedious hours transposing tapes.

### CHALLENGE

Find a technology tool to **streamline the time and energy Zach dedicates to completing every class assignment involving reading and/or writing**. The tool needs to compensate for Zach reading disability so that his efforts can be directed to expanding his mental abilities rather then dealing with techniques to circumvent his handicap.

### SOLUTION

After reviewing Zach's file and discussing the situation with him, it was determined that he would be the perfect candidate to pilot a Reading Edge device.

### ASSESSMENT

The Reading Edge is a sophisticated device that rapidly converts printed text including books and worksheets, to speech output. The text file can also be saved to import to a computer word processor.

Zach qickly adapted to the mechanics of the device and with his father began to explore all of the options available. Initial reports are that the tool has been very useful in helping Zach compensate for his reading disability.

### EXPENDITURES

| | |
|---|---|
| Xerox Reading Edge with audio/print [Low Vision Aids] | $5,377.00 |
| Blazie Disk Drive with cable | $484.00 |
| Carry Case | $175.00 |

# CASE STUDY #9

*Leonard Marston, Teacher of the Visually Impaired*

## SITUATION

Eric is an elementary ***Gifted*** student who is also ***legally blind***. He has a history of ***generalized albinism.*** He receives services for the Visually Impaired on a consult basis. Eric has great difficulty seeing and staying focused visually with any assignments. Paper and pencil tasks are quite time consuming for him to complete.

Eric was evaluated by the ***Lighthouse for the Blind of the Palm Beaches***. His Distance Visual Acuity range was: OD 10/60; OS 10/60. His Near Visual Acuity was: OD 20/40; OS 20/40. The agency tested a number of devices with Eric before recommending the 7X Beecher which gave Eric 20/20 visual acuity with each eye.

The evaluation report from the Lighthouse for the Blind of the Palm Beaches, was shared with the Child Study Team, who, in turn, requested a district tech eval. The recommendations of the agency precluded the need for any additional assessment.

## CHALLENGE

To provide an assistive device that would **correct Eric's vision sufficiently to enable him to see** class work written on the chalk board or presented on an overhead projector.

## SOLUTION

Order a **7X30 Beecher** for Eric. During the testing, Eric was able to see small items written on a board at the end of the room without any difficulty. He was also able to look below the telescopic device to see reading material on his desk. A +2 diopter cap enabled Eric to see print material 18 to 24 inches away.

## ASSESSMENT

Eric used the 7x30 Beecher Mirage Binocular in a gifted Algebra class where the teacher relies heavily on an overhead projector to work out problems and present material. Eric could not read the overhead without getting out of his seat to get close to the board. With the aid, Eric was able to stay in his seat and see the overhead projection.

Eric quickly became accustomed to looking through the aid for distance and through his glasses for near vision tasks. He was able to see all overhead work from a distance of 10' and material written on the board from approximately 16'. Eric was very excited about the Beecher Mirage and did not let the cosmetic appearance bother him. He was far more concerned with the utility benefits.

With the +2 diopter cap, Eric was able to read a computer screen or sheet music from 18 to 24 inches away. Prior to having the aid, Eric had to get very close to the computer screen to see any images and his teacher had to enlarge his sheets of music so that he could play his instrument.

## EXPENDITURES

| | |
|---|---|
| 7X30 Beecher Mirage Binocular [Lighthouse for Blind/Beecher] | $442.00 |

# CASE STUDY #10

*Peg Marston, Teacher of the Visually Impaired*

## SITUATION

Peg Marston is a leader in revolutionizing the delivery of services to students with visual handicaps. The revolution began when Peg found herself supporting four high school students who were blind or visually impaired. The high school was one of several schools that Peg served as an itinerant teacher to the visually impaired, but Peg found herself inundated with teacher-made worksheets, tests and ***class assignments that needed to be Brailled or converted to large print for use by the students***. Two of the students were in advanced classes but all four of the students were enthusiastic learners and prolific readers/ writers and Peg was spending an average of 2-4 hours every night Brailling the necessary class work. The Department of ESE placed an Apple IIe computer with BEX software at Peg's home to help with the work load. BEX is a Braille conversion program.

The four students included Amy and Jason, both gifted students in advanced placement courses, and Scott and Donald, who were both visually impaired. Amy was ***blind*** from birth. She was born prematurely and her exposure to pure oxygen in the incubator resulted in her loss of sight. When she entered high school, Amy used a Perkins Brailler in class and had a tutor companion assigned for mobility safety when transferring between classes. Jason was also blind at birth and, like Amy, was enrolled in advanced placement courses. He was also Braille literate. Jason was born blind due to congenital Lebr' Maorus.

Scott had ***retinitis pigmatosa***, a condition that materialized when he was 11 years old. Progressive in nature, ***retinitis pigmatosa*** effected the peripheral vision which gradually reduced over time until he had tunnel vision. Eventually, Scott will go totally blind. When Scott entered high school, he had tunnel vision but was beginning to learn Braille in anticipation of the total loss of sight. Scott could read a computer screen if it was displayed in black and white and the lights were turned off in the room. He was also making increasing use of text screen speech synthesis. Donald, the fourth student, was able to see shapes silhouetted against light, but could not make out any details from the shape.

All four students were registered as members of Recordings for the Blind. The $37.00 registration fee provided a lifetime membership and entitles members to borrow taped books.

Peg had an Apple IIe computer with BEX Braille conversion software in her classroom and at home. The Department of ESE placed an Ohtsuki printer which prints Braille with the English translation underneath. The Apple allowed Peg to type the classroom material into the computer, convert it to Braille and print it on the Ohtsuki for the students to read. They also had the option of "reading" the text on screen using the Echo Speech Synthesizer.

Then, Herman Matos, Department of Adult, Community and Vocation Education, Special Needs Assistance Program, proposed a wholistic approach to "modernizing" the processes in the classroom. Peg Marston was receptive to Herman Matos' suggestions because she had been researching new techniques and procedures to use in her classroom and she made significant suggestions about the final technical design.

## CHALLENGE

To provide technology tools that will ***reduce the amount of time required to convert classroom material to Braille*** by streamlining the process.

## SOLUTIONS

The classroom was equipped with a DOS-based computer, a modem for remote research, a scanner with software drivers, a DecTalk speech sythesizer, and software including Word Perfect, Tiny Talk, ASAP, and Duxsbury.

Amy and Jason were introduced to Braille n' Speaks to replace the bulky and noisy Perkins Braillers. Both students used the device to take notes in class, to study and to complete written assignments including tests. They soon learned that information stored in the Braille n' Speak could be:

1) pulled into Word Perfect software in a DOS-based computer to:
    a) convert to Braille using Duxsbury software.
    b) "read" using the text screen-reading Tiny Talk or ASAP software and the DecTalk speech sythesizer.
2) plugged directly into the Ohtsuki printer to print out Braille/English hardcopy.

The IBM Screen Reader was also placed in the classroom to determine its effectiveness with blind students.

The four students were also trained on the use of the modem to access local and national bulletin boards, to share e-mail and to retrieve remote data. The students had not previously been able to make use of the school library for research unless someone retrieved the books and read them outloud. The academic abilities of these students were too advanced to limit their access to information by such cumbersome and humiliating strategies.

Peg Marston was trained on the scanner and it's software drivers. Peg and the students were trained on the new conversion and screen-reading software.

## ASSESSMENT

Amy and Jason quickly adapted to the Braille n' Speak and eventually, as they were preparing to graduate, purchased their own devices along with a Blazie printer. Both of them preferred to plug the Braille n' Speak directly into the Ohtsuki printer but occasionally pulled their documents into Word Perfect to read on screen. Scott also became proficient on the Braille n' Speak as did Donald.

The students found the IBM Screen Reader to be too difficult to use. It was a proprietary device with unique commands not consistent with other Braille devices. The students elected to not use the screen reader.

Jason embraced e-mail and remote data retrieval. He eventually started his own Bulletin Board Service [BBS]. Jason provided the leadership in the class to motivate the other students to try telecommunications. Amy was the most reluctant to use the modem but was gradually persuaded by Jason to use the tool.

Peg immediately made use of the scanner to scan all typed worksheets and tests for conversion to Braille. She was able to dramatically reduce the amount of time needed to convert the student's assignments. She did discover that when she pulled documents into Word Perfect she had to set the margins at 40 or the alignment did not print correctly.

## EXPENDITURES

| | | |
|---|---|---|
| Braille n' Speak [Blazie Engineering] | $1,070.00 | |
| Ohtsuki printer [American Thermoform] | $5,000.00 | (approximately) |
| Blazie Printer [Blazie Engineering] | $1,45.00 | |
| Zenith workstation | $1,169.00 | |
| Monitor | $489.00 | |
| Sound Blaster | $479.00 | |
| Word Perfect | $40.00 | (CAP program) |
| Duxsbury (Blazie Engineering] | $495.00 | |
| ASAP (Automatic Screen Access Program) [Blazie] | $525.00 | |
| Tiny Talk[OMS Development] | $70.00 | |

# CASE STUDY #11

## *Near-drowning*

## SITUATION

Cory was involved in a ***near-drowning*** at the age of three. He and his family moved to Palm Beach County in 1991 when Cory entered the 4th grade. Cory was evaluated for services at that time. Records from Cobb County, Georgia indicated that Cory had attention deficits. His ***visual sequencing*** and ***active working memory*** were impaired by the accident but he had developed good auditory skills.

***Static anoxic encepalopathy*** affected Cory's speech resulting in a delayed response time. He needs to be given an extra ten to fifteen seconds to formulate a response. Cory is very verbal though his speech is slow and impaired. The listener must exercise patiences while waiting for Cory's communication. Cory also exhibits ***excessive motoric activity***. The report recommended that Cory be given tasks to help him vent some of this activity.

***Written tasks*** are a real chore for Cory. He writes with his right hand but the product is virtually illegible. Cory exhibits a lot of physical strain and concentrated attention while trying to write. A number of alternatives are recommended to replace written assignments. The alternatives include use of a word processor. It is also recommended that Cory learn typing skills as soon as possible.

Cory does feed, bathroom and dress himself but he needs assistance in the cafeteria where he has difficulty holding his tray, opening the milk carton and opening small containers such as catsup. A tutor companion assists Cory with these tasks. These factors are significant considerations when determining the best way for Cory to transport a laptop.

Cory had a difficult year during the 1991/92 school term. Abusive language and posturing behaviors were documented. In 1992, he moved into a different class and a ***behavior management program*** was initiated. Cory helped to write the behavior contract and set his own personal goal to "pull self out of bad mood."

Cory receives speech, occupational and physical therapies. He receives most of his educational program in a class for the physically impaired.

## CHALLENGE

To provide Cory with an assistive system that:

Give **auditory feedback** which is one of Cory's strengths.

Can be **transported easily** since Cory has difficulty carrying objects.

Has **rate enhancers** to improve speed of input.

Has **word prediction** to help Cory in the **selection and spelling of words**.

## SOLUTION

Cory was provided with a Mac PowerBook and an ImageWriter II printer. ***Co:Writer*** and ***Write Outloud*** were installed on his system. It was stipulated that Cory would not carry the laptop by himself.

## ASSESSMENT

Cory loves his computer and loves working with it. A hard disk failure in the Fall of 1994 was repaired within three weeks. Cory was very concerned during that time and was tremendously relieved when the laptop was returned to the school.

## EXPENDITURES

| | |
|---|---|
| Mac PowerBook 14 HD | $1,751.00 |
| ImageWriter II | $388.00 |
| Co:Writer | $99.00 |
| Write OutLoud | $299.00 |

# CASE STUDY #12

*Written by Bill Fox, Teacher of the Emotionally Handicapped*
*Jeff Davis Middle School*

## SITUATION

Bill Fox has been teaching ***Emotionally Handicapped*** students at the middle school level in Palm Beach County for nearly two decades. In any given class period, he has a dozen students or more, in ***grades six through eight***. Each student works at his or her own pace and receives instruction in work that ensures success.

Students are assigned to his class from one to six periods daily. Some are mainstreamed for electives such as Physical Education and Art. Still others are mainstreamed into academic classes. Bill Fox provides ***instruction, remediation and advanced work in English, Math, Science, Social Studies, Writing and Critical Thinking Skills*** for all his students. In the pre-technology days, students normally received instruction from textbooks, workbooks, lectures and discussions. From time to time, a Severely Emotionally Handicapped (SEH) student is also assigned for a class period.

## CHALLENGE

Something other than traditional teaching and behavior modification methods and practices was needed to **change negative behaviors** and **motivate** Emotionally Handicapped students to learn.

Media guru Marshall McLuhan postulated that, "The medium is the message." With this in mind, it seemed that appropriate and judicious use of computer technology would go a long way towards meeting the needs of students with emotional handicaps while preparing them for the challenges of the 21st century.

Classroom computers would serve two purposes. They could become the **"hook" in a behavior management program** by making working on the computer contingent upon good behavior. And, they could **motivate the students academically** by presenting academic information in a comprehensive, colorful, self-motivating and non-judgmental way.

## SOLUTION

"In 1985, FDLRS provided me with an old, but workable, Apple IIe computer. Students couldn't wait to use it, even for math and grammar. Their attention span, while using the computer, increased tremendously vis-a-vis the length of time they previously functioned effectively with the traditional methods of instruction. A year later, FDLRS gave my class an Apple IIGS computer, which we still use for academics and chess games.

In 1987, I wrote a proposal, and received, a grant, from a local community agency, to purchase a computer and printer. It came from the now defunct Palm Beach County Education Foundation. An IBM-compatible, dual disk floppy drive, 640K machine was purchased. It is nothing by today's standards, but it was hi-tech at the time.

Additional, and more up-to-date hardware and software, has been made available through the Florida Diagnostic and Learning Resources System (FDLRS/Alpha) and the Department of Adult, Vocational and Community Education. The classroom currently has two 486 computers, one with a CD ROM and one with a laser disk player. There is also a TRS 80, a Tandy 1000 and several older but still serviceable IBM-compatible machines that are used for writing, grammar and math skills. I am still looking for additional, more modern computers to keep up with today's software advances.

Personnel in both departments understand just how effective using computers with Emotionally Handicapped students has become, and have provided whatever additional support was needed to make my program a successful one."

Veteran EH students are responsible for instructing new EH students in the appropriate use of hardware and software. These students are then obliged to instruct all newer admissions into the class. Peer teaching is quite effective when used in this manner as students come to rely on one another for assistance and companionship in a positive manner.

We use several types of software in this class:

1. Students use basic skills software in all subjects to supplement materials in their textbooks and workbooks. **SRA Math**, **MathBlaster Mystery**, **Oregon Trail**, **Word Attack III**, **Knowledge**, **Science**, **Undersea and Space Adventure**, **Grammar Gremlins** and **Bodyworks** are some of the more popular instructional software titles we use.

2. Critical thinking skills are also a priority. Students enjoy the **Carmen San Diego** series, **Chess**, **Shadow President**, **Outpost** and **Moonbase**, the **Incredible Machine** and the **SIM series** including **SimCity**, **SimEarth**, **SimAnt** and **SimLife**. Arcade games are not permitted.

3. Students learn to operate Windows using **Microsoft Works** and desktop publishing using **Disney's Animation Studio**, **Print Shop** and **Arts & Letters**.

4. The Class is test-marketing an integrated, multi-media science program called **Biopark** for the entire school. The program combines Windows, a CD ROM disk drive and a laser disc. Students observe, research information, write and print their own reports on specific subjects of their choosing. They can incorporate written text and visual materials in their report presentation.

5. Students first learn to write on **Writing Assistant**, then graduate to **Works** and **WordPerfect** for their reports and class work.

6. With a Classroom **Prodigy** subscription, EH students use the Internet to write to pen pals throughout the United States. Students also go on-line with National Geographic, Nova and other instructional data bases offered by **Prodigy**.

7. EH students with learning disabilities also benefit from computers in many ways. They work at their own pace and find writing on the computer much easier than struggling with pencil and paper.

8. Our more advanced students use software that teaches geometry, algebra, and Spanish.

## ASSESSMENT

Over the years, results have far exceeded expectations. While EH students have been using computer in my class, their:

1. Attendance has improved.
2. Rate of learning and comprehension has increased.
3. Behavior has been much better than EH students in other classes as measured by the number of discipline referrals.
4. Ability to enter and succeed in mainstream classes has been at a far quicker rate than other EH students in the school.
5. Scores on standardized tests have been higher then their EH peers.

## EXPENDITURES*

| | |
|---|---|
| AST 486/33 Model 12-90350 microcomputer | $2,643.64 |
| CD ROM internal drive | $456.33 |
| 345MB HD | $157.00 |
| Fax Modem | $200.00 |
| Epson LQ 570 Plus 24 pin printer with cable | $300.00 |
| SoundBlaster | $124.70 |
| Multimedia Amp. system | $52.92 |
| Pioneer CLD V2400 with remote | $645.00 |

*Expenses include only the most recent hardware additions to the program. **BioPark** was donated by the Computer Curriculum Corporation for the pilot project.

*Technology Techniques*

# Using Computers With Emotionally Handicapped Students: For Learning, Fun and Profit

*By William Fox, Jefferson Davis Middle School*

Imagine emotionally handicapped children learning fractions, decimals, spelling, grammar, social studies and science just because it's fun!

Emotionally handicapped students at Jefferson Davis Middle School in West Palm Beach, Florida, use computers in many ways:

**Computer time serves as a motivational device.** Computers are non-judgemental and provide a learning environment emotionally handicapped students can successfully control. Appropriate software programs provide simple and visually attractive instruction, allow for practice and provide students with immediate feedback—all essential items needed for learning to take place.

**Emotionally handicapped students master word processing skills.** Already turned off by traditional writing methods, students find it easier and more enjoyable to write reports and express their feelings using a word processor.

**Students build meaningful databases.** Emotionally handicapped students construct and use databases for personal use—record, tape and baseball card collections, for example. One emotionally handicapped student placed the school's audio-visual equipment on the database he constructed. Then he showed the media specialist how to use it.

**Using simple desktop publishing software, emotionally handicapped students earn money by running a profitable business.** Students design and sell greeting cards, memo pads, stationery, signs, banners, puzzles, mailing labels and calendars to students, faculty and neighbors. They earn sizeable commissions for their efforts. Profits are used to purchase supplies and additional software for business and instructional use.

**Business skills are learned.** Using an uncomplicated spreadsheet program, emotionally handicapped students compute their commissions and record income, sales, profits and expenses. Paid monthly by check, students become familiar with the banking system.

Emotionally handicapped students overcome their fear of learning . . . get a chance to feel good about themselves.

**A positive self-image is developed.** Emotionally handicapped students learn they must work together for their business to succeed. Interfacing with peers and adult authority figures, the students also acquire positive social skills.

**Emotionally handicapped students become peer teachers.** Last summer emotionally handicapped students learned to operate Apple and IBM equipment and familiarized themselves with the school's educational software programs.

For their final project, the students constructed and annotated a database for this software. Teachers utilize this reference guide to determine appropriate software for their own students.

When the regular school year began, emotionally handicapped students taught other special education students what they learned over the summer. These children then showed their teachers how to use computers and instructional programs with their classes.

Clearly, proper use of computers with emotionally handicapped youngsters is one of the most effective instructional, image-enhancing and behavior management tools available to teachers today. Emotionally handicapped students overcome their fear of learning, become computer literate, earn money and get a chance to feel good about themselves.

Sixties media critic Marshall McLuhan decreed, "The medium is the message." Would that he could see just how important the medium of computers is in successfully educating emotionally handicapped children.

*William Fox is a veteran emotionally handicapped teacher at Jefferson Davis Middle School in West Palm Beach. A professional writer, educational and public relations consultant, Mr. Fox firmly believes computers give special education teachers the edge in educating their students.*

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## MIMI Fests Come To Florida

The crew of the *MIMI* is scheduled to host dockside and field trip visits—*MIMI* Fests— in five Florida cities during December through March. A dockside visit was held in Jacksonville December 10-14. Plans also are to visit Fort Lauderdale, Miami, and Tampa in January and February and St. Augustine in March.

*MIMI* Fests are week long educational programs that feature the 72-foot ketch *MIMI* and The Second Voyage of the *MIMI*. The Fests include a wide range of educational activities that tie in with students' *MIMI* studies and provide students with a greater awareness of the marine environment.

The highlight of the day for many students is the chance to meet "Captain Granville"—Peter Marston in real life— a central character from the dramatic video component of the MIMI Voyages and the real-life owner of the MIMI.

For more information on the MIMI Fests, contact Paula Walker at 800/321-7511 or 914/946-6360.

# CASE STUDY #13

*Cerebral Palsy*

## SITUATION

Korey was one of twin boys who were born at 32 weeks gestation. He weighed one pound, ten ounces at the time of birth and remained in intensive care for his first three months of life. Korey was diagnosed with a severe case of ***cerebral palsy***. He cannot sit unsupported. He also cannot crawl, walk or talk. Korey is ***non-verbal*** because he is not able to imitate lip or tongue movements which prevent him from uttering vowels or consonants singly or in sequences. He communicates by pointing, gesturing, and uttering single words. Korey receives speech, occupational and physical therapies.

In preschool, Korey used a variety of language boards modified for all activities and learning centers in the classroom. However, he reverted to signs and gestures to communicate ideas, wants, and needs not found on the boards.

Unlike many AAC users, Korey readily ***initiates communication*** with familiar and unfamiliar people. He developed his own ***unique communication gestures*** for specific people in specific situations. For instance, Korey would "hook" his index finger to request the video Hook or to identify his Halloween costume. These gestures are frequently inefficient because listeners are unable to interpret Korey's meaning.

## CHALLENGE

To provide a system that can meet both communication and educational needs. The system should

-require **minimal training** so that cognitive energy can be used to develop language and emergent literacy skills.

-offer **alternate input methods** to meet Korey's changing physical skills.

-have an **expanding vocabulary** that can grow with Korey's emerging literacy skills.

-offer a **customized and extensive vocabulary**.

-have a **dynamic display** to keep pace with Korey's communication needs.

-have a **standard keyboard overlay** and **print capability** for written assignments.

## SOLUTIONS

Korey's parents initially supplied him with a language master. During the time he was enrolled in preschool, Korey had the opportunity to try a Digital Augmentative Communicator and a TouchTalker. An IntroTalker was placed with him in order to allow for inclusion in classroom activities.

Korey was introduced to a DynaVox, a communication device that uses a dynamic pictographic representational system accompanied by voice output. The device was selected because of Korey's ability to use picture symbols to communication a variety of language functions. During the initial evaluation of the device, several pages of vocabulary were programmed into the DynaVox. The vocabulary was categorized on several pages specific to daily routines, activities and personal needs.

## ASSESSMENT

Korey's parents provided him with a language master. The device was not diverse or efficient enough to approximate Korey's communication needs.

The Digital Augmentative Communicator (DAC) was primarily used as an early language intervention tool and as a system for evaluation. The DAC only allows for direction selection and requires the user to change overlays and save the vocabulary to disk. Both of these features were too limiting for Korey who needs an alternate input method and access to an expanding vocabulary.

The TouchTalker system has the ability to meet Korey's vocabulary needs but training requirements are extensive. Previous experience with other students proved that integration of this system into the classroom environment is extremely difficult without a tremendous amount of support.

The IntroTalker was used in preschool. It gave Korey the ability to request things he wanted and to respond to simple questions. The device was limited to 30 vocabulary items which was not sufficient to meet Korey's communication needs. His speech/language pathologist also reported problems with changing the overlays and understanding the voice output. The pathologist spent a considerable amount of time cutting out magazine pictures or drawing pictures to use on the different overlays. In addition, Korey accidently erased the memory of the IntroTalker several times.

The IntroTalker was not meant to be used as Korey's primary mode of communication because it was far too limited to meet his communication needs. Instead, the teachers made specific overlays that allowed Korey to participate in specific activities that required voice output. These activities included songs, rhymes and storytelling.

From the moment Korey was introduced to the DynaVox he demonstrated proficient use. Korey was able to immediately identify pictures by label, attribute and function when requested to do so. He demonstrated an understanding of concepts such as quantity, comparison, spacial relations, size and texture. He moved naturally into a mode of scanning the screen for the symbol that represented the answer requested. He continued to use his gestural system to communicate along with the DynaVox. Most importantly, the DynaVox has the technical capability to expand as Korey's communication abilities mature, it accepts alternate input methods and the existing, extensive vocabulary can be easily customized.

**Manual boards are also available for specific themes or functions. The manual boards mimick the same pic symbols used on the AAC devices. Maintenance of manual boards is imperative in the event that the AAC device requires repairs.**

## EXPENDITURES

| | |
|---|---|
| **FIRST SYSTEM** | |
| Language master | provided by parents |
| **SECOND SYSTEM** | |
| DAC - 72 minutes of memory, app. 8,000 words [Adaptive Communication Systems] | $3,995.00 |
| **THIRD SYSTEM** | |
| TouchTalker with DECtalk Speech [Prentke Romich] | $4,825.00 |
| **FOURTH SYSTEM -1991** | |
| IntroTalker [Prentke Romich] | $940.00 |
| **FIFTH SYSTEM -1993** | |
| DynaVox - [SST-ACS]<br>includes DynaVox SynaSyms with 2000 pics, 1 MG upgrade and wheelchair mount [$579.00] | $5,909.00 |
| **1994** | |
| DynaWrite card upgrade | $500.00 |

# CASE STUDY #14

### *Cerebral Palsy - Nonverbal*

*Melissa Pebly, Program Planner, Physically Impaired*

## SITUATION

Robyn was evaluated in 1992 when she was 3 years old. She was classified as ***nonverbal*** although she had already developed a communication system that included gestures, facial expressions, vocalizations, manual communication boards and a digitized voice output device programmed for specific activities. Robyn occasionally produced intelligible single words particularly if the listener was familiar with the context. She has a slight drool but can swallow when reminded to do so.

Robyn has a significant medical history including ***premature birth*** at twenty-six weeks gestation, enlarged right ventricle, respiratory distress syndrome, retinopathy and seizures. She is diagnosed with left hemispherical ***cerebral palsy*** (spastic triplegia motor deficit) but is ambulatory with braces. She received early intervention by participating in agency preschool programs and presently continues to receive occupational, physical and speech therapies.

Robyn has ***good head and trunk control***. She is able to sit erect in an armless chair without difficulty. Her equilibrium/protective responses are mature. Robyn's right upper extremity range of motion and strength are within normal limits. Her ***left side is slightly limited*** at shoulder and forearm and she tends to use her left hand as a gross stabilizer. When physically taxed, Robyn exhibits increased tone throughout her left upper extremity.

Robyn exhibits good visual attention to all material presented. She wears eyeglasses but does have visual field impairment on the right side. She compensates for the deficit by turning her head. She can locate and differentiate between one inch pictures.

Robyn has no difficulty in selecting symbols for targeted categories and is able to select a single icon to represent a complete message (i.e., **car** picture represents "Let's go for a ride.")

## CHALLENGE

Robyn needs an **electronic voice output system** that is **easily programmed** and offers an **expanding vocabulary** that can be customized. The system should have easy access through a touch sensitive panel. The team recommended that Robyn's initial training on the device should focus on facilitating the use of a variety of language functions to promote the development of literacy skills and not serve as an identification or labeling task. Implementation ideas were provided. [See attachment 1]

## SOLUTIONS

Robyn was reassessed for the 93/94 school term on a DynaVox. Once she was familiar with the symbols, she had little difficulty with categorization tasks using the dynamic screen display. She did need cueing to isolate her finger in order to minimize accidental activations but quickly mastered the task and was then able to access targeted vocabulary represented on overlays with up to 50 items.

## ASSESSMENT

The Macaw was placed with Robyn in 1993. The teacher developed overlays to go with specific activities in the class. Robyn used the device and seemed to enjoy the voice output. The teacher found the device easy to program but had difficulty storing overlays on different levels and technical assistance had to be provided to help her use the multiple levels feature of the device. The memory of the device was limited and the teacher had to be selective in storing overlays.

Robyn's mother wrote some comments about the families' reactions to the DynaVox. The comments include their experiences at Camp Chatterbox, a special summer program for AAC users:

"As parents, we were very concerned about her using a machine that would talk for her. We felt that she needed to learn to talk for herself, but we agreed to follow the advise of the professionals. She started out on a language master, moved on quickly to a Macaw, which she out grew in no time. The decision was made to put her on a DynaVox. Her speech was improving monthly."

"Robyn rapidly adjusted to her DynaVox at school and it enabled her to participate in daily activities in a more advanced way then before. She had no problem flipping from screen to screen but did have a little difficulty adjusting to the new symbols used in the DynaVox. That soon passed."

During July, 1994, Robyn and her mother attended **Camp Chatterbox in Mountainside, New Jersey.**

"We were up early Monday morning excited about our day. The morning was spent at a local school. We were greeted by reps from many different companies and introduced to our respective rep. The DynaVox rep, Eddie, quickly loaded the camp program into Robyn's device and we were set for the week.

There were 10 children all with varying disabilities and ages. The groups were divided up according to devices and we started exploring the new program. Each day the children learned about different things in nature. Each afternoon, we moved to the nature park, where we all had lunch and played for a while." Then, the staff had the campers review the day's activities using their AAC devices to communicate their feelings and questions.

"The parents had instructions given to them by the reps on the use of their children's devices, along with question and answer periods.... Upon return home, we were able to show dad and the teachers things they never knew about the DynaVox.

Robyn started kindergarten in August of this year [1993/94] in a mainstream setting. And, we were able to give some lessons to her new teachers, including her speech teacher who had never seen a DynaVox before.

Robyn's speech now improves daily and she can actually program some things in her DynaVox herself!!"

Manual boards are also available for specific themes or functions. The manual boards mimick the same pic symbols used on the AAC devices. Maintenance of manual boards is imperative in the event that the AAC device requires repairs.

## EXPENDITURES

### FIRST SYSTEM -1993

Macaw

### SECOND SYSTEM -1994

| | |
|---|---|
| DynaVox | |
| Walk It with DynaVox Up Basket [C.J.T. Enterprises] | $455.00 |
| DynaWrite card | $500.00 |

## ATTACHMENT 1

## Developed by Melissa Pebly, Program Planner, Physically Impaired, Palm Beach County

The following are suggestions that can be implemented in order to promote the development of literacy with students who have severe speech and/or physical disabilities.

1. The use of stories that have a single repeated line can be utilized to foster participation in storybook reading.

   Provide a loop tape or have the student verbalize when cued [i.e., "I'll huff and I'll puff and I'll blow your house down."

   Predictable Storybooks available through DLM are an excellent tool for this type of activity.

2. Give students an opportunity to voice comments that will gain actions from peers or teachers (i.e., "turn the page" or "act this part out"). This can be done via a voice-output system or through verbalization.

3. Repeated readings of slide-taped books have been shown to be effective in the development of early literacy skills. These can be adapted so that they can be activated with a single switch.

4. Stories can be constructed using Picture Communication Symbols to help bridge the gap between pictures and traditional orthography [text].

5. "Talking Books" are available that have been specifically designed for students with learning and/or physical disabilities. These include:

   Storytime by Don Johnston Developmental Equipment
   Gateway Stories by CAST

   Children are able to turn the pages and listen to text read aloud via the computer.

6. Provide students with an opportunity to write about what they read. Several software programs are available that allow content lists to be entered into the computer so that students can put sentences together.

7. Computer-based reading programs that emphasize the overlearning of high frequency words are good reinforcers. Two such programs include:

   Sentence Master by Laureate
   Brick by Brick by Hartley

# CASE STUDY #15

*Arthrogryposis*

## SITUATION

Marcus is 6 years old. He is considered to be quite bright and will be tested for ***giftedness*** this year. He has ***Arthrogryposis*** which causes a fixation of the joints in the extremities. He cannot bend his elbows or raise his arms. His arms are underdeveloped and only reach to about his waist. His wrists are not flexible and fine motor skills are considered to be 10% of what would be expected of a child his age. Marcus is ambulatory with the aid of shoe supports. There is weakness in his legs.

Marcus is ***very verbal and social***. He actively engages in class activities and interaction with classmates. He attempts to do all the tasks assigned as part of class work. ***He does NOT LIKE modifications***. This attitude is, in part, an extension of the philosophy of Marcus's mother. She wants Marcus to be treated as normal as possible and to function as normal as possible. However, he bounces around the room from group to group because he can't really perform many of the assignments given to his classmates. He does share a ***tutor companion*** who helps him with some of his class work.

Marcus gets ***frustrated*** in class when he tries to do many of the tasks and ***fatigue*** is an issue. Coloring, for example, tires his arms quickly because Marcus has to use shoulder movement to rock the crayon back and forth. He is ***very much aware that his "best effort" does not match the minimal standard*** evident in the papers produced by his peers. He does not appreciate false praise, "You did a great job, Marcus." when he knows his efforts are sub-standard. Marcus's frustrations have turned into behavior problems on occasions.

Marcus prefers to use his hands for as many things as possible. His hands turn inward but are flexible. His ***fingers are basically non-functional*** though he can do some gross motor activities. For example, he was observed grabbing a paper cup using his thumb and pointer finger. But, Marcus has to eat mouth to food and depends on someone to put a straw in his drink which has to be placed in close range.

Marcus is in a regular elementary class. He visits the classroom for the physically impaired each day for consult services. In the PI classroom, he has access to a computer to do word processing or academics. Next year, Marcus will have access to an integrated learning system [ILS] in his regular 2nd grade class. [See Case 2]

Marcus quickly acclimated himself to the computers in the classroom. He likes to use the keyboard but has difficulty with the top row of keys. He uses both hands to manipulate the mouse and his thumb to activate the "click" but fatigue is again an issue.

## CHALLENGE

To provide Marcus with a system that he can **access comfortably** and easily for some **academic learning and all written expression**.

## SOLUTIONS

Susan George, the Occupational Therapist tried a Windsor Self-Feeder with Marcus to assist him in eating. He controlled the device with a switch.

A Macintosh computer with **HeadMouse and voice activation** was ordered to permit Marcus access to written expression. The HeadMouse sensor replaces the standard mouse for people who cannot use their hands. It is a wireless optical sensor which tracks a tiny and disposable target that is placed on the user's forehead or glasses. It can be combined with an on-screen keyboard which provides an image of the keys on the computer display, with key selection made by positioning the mouse pointer over a key.

The mother was also referred to the Children's Services Council, a county tax district, which has an annual budget of $50,000.00 to spend on assistive technology and therapeutic equipment for children who live within the district. CSC funded an identical Mac system to the one recommended for Marcus's education program, for home use.

## ASSESSMENT

The trail period with the self-feeder was successful and one was placed permanently for Marcus's use at school.

## EXPENDITURES

| | |
|---|---|
| Electric Self-Feeder with carry case and battery charger | $1,695.00 |
| on order | |
| PowerBook 520c | $2,462.00 |
| 8MB memory expansion kit | $398.00 |
| HeadMouse Head control | $1,557.00 |

# CASE STUDY #16

## *Educable Mentally Handicapped*

### SITUATION

Ryan is a 4th Grader in a full-time ***Educable Mentally Handicapped*** class. Ryan's mother has asked repeatedly that Ryan be exposed to more challenging and diverse information. She would like him involved in inclusive education. Recently, Ryan has been paired with regular 4th graders to do some AIM activities. The initial experiences have been very positive.

Ryan has ***microphthalmia in his left eye*** which is sightless. His visual perception includes difficulty in sequencing which has effected his ability to read. Ryan has a slight case of ***cerebral palsy*** which effects his gait and fine motor skills. He was dismissed from occupational. and physical therapies in May 1994. Records read, "range of motion and muscle strength are within functional range."

Ryan also has a ***hearing loss*** in his right ear. He receives speech/language for ***stuttering and articulation difficulties.***

Records indicate that when he was younger, Ryan had a meager verbal vocabulary and had difficulty forming sentences. At present, his receptive language remains stronger then his verbal expression.

Ryan is an enthusiastic and positive individual. His teacher enjoys having him in class. He frequently helps her with specific chores and tasks in the classroom.

Ms. Little's class has one District funded Integration Learning System [ILS] computer and printer. Ryan was VERY proud that in December he completed Discovery English, the first level of the ILS. This level includes audio directions to accompany the text on the screen.

### CHALLENGE

A District speech/language specialist reviewed Ryan's records and recommended a **word prediction** program be tried with Ryan to see if it improved his **written expression**.

### SOLUTION

The software and a computer were placed in January 1995 with the stipulation that the teacher document Ryan's progress and that his case be reviewed in March 1995.

### ASSESSMENT

To be reviewed in March.

### EXPENDITURES

| | |
|---|---|
| Macintosh LC 575 | $1,879.00 |
| StyleWriter II Printer | $269.00 |
| Write OutLoud software [Don Johnson] | $120.00 |
| Co:Writer software [Don Johnson] | $280.00 |

# CASE STUDY #17

## *Cerebral Palsy*

## SITUATION

Jason was in 3rd grade when he had his first tech evaluation. He has spastic quadriparesis, a form of ***cerebral palsy*** and uses a wheelchair for mobility. There is some uncontrollable ***spastic movements*** in his hands and forearms but Jason does use both hands when accessing a computer keyboard. He uses his right hand for single finger key strokes and his left hand to activate two or three key functions such as shift + letter to get capitol letters or Ctrl, Open Apple, Reset to warm boot the computer. Jason was also able to load and unload a 5.25" disk in the drive but he does ***not have functional handwriting***. The writing process is to laborious for him and increased tone is evident when he tries to write.

Jason is ***nearsighted*** and wears thick, magnifying lens. With the corrected vision, he is able to read normal size text. Jason has a ***slight drool*** when he talks but his speech is intelligible and he is a very social person. Indeed, Jason is very distractible because he is constantly monitoring the activity and people around him.

Jason was already familiar with the Apple IIe and the Magic Slate software when he was first observed. The technology was available in the classroom and Jason had quickly acclimated himself to a computer environment. He liked to explore the keyboard and try different keys to operate software programs. During the observation, Jason typed, from a worksheet, the phrase "buy the peppermint sticks?" It took him three minutes. He also selected several educational programs and completed each. He responded very well to auditory and visual reinforcers built into the software programs.

Jason likes to be as independent as possible and to do things for himself. For example, he took the initiative to put away the materials he had been working on while at the computer. He gave directions or requested items that he could not reach.

Jason was mainstreamed in social studies and science, spelling and music. The remainder of his time was spent in the PI program. Testing revealed that Jason's achievement level was significantly below his ability level.

## CHALLENGE

To provide Jason with a **portable system** that can be mounted on his wheelchair. The system is primarily for **written communication**.

## SOLUTIONS

A laptop and printer were purchased for Jason to use. The laptop could be placed on his wheelchair tray or on a table. Jason used the Deskmate software built into the system. Jason really liked using the computer which moved with him to middle school where he was placed in a Varying Exceptionalities class for most of the day. Jason was also mainstreamed in a few classes.

In the Fall 1994, the teacher reported that Jason's battery charger/power cord was damaged. Because the new budget accounts had not yet been activated in the district system, it took two months to get the power cord replaced. In the meantime, Jason expressed interest in a Mac system used by Cory, another student in his class. The Mac laptop included word prediction which Jason was now ready to use. A re-evaluation of the situation resulted in a recommendation to move Jason to a Mac laptop system.

## EXPENDITURES

### FIRST SYSTEM (1991)

| | |
|---|---|
| Tandy 2810 HD | $1749.00 |
| Carry case | $27.96 |
| DMP 302 24 pin printer | $419.30 |
| 12 foot cable | $27.96 |

### SECOND SYSTEM (1995)

| | |
|---|---|
| Mac laptop | $2,462.00 |
| 8 MB memory expansion kit | $398.00 |
| StyleWriter II printer | $269.00 |
| Co:Writer | $99.00 |
| Write Outloud | $290.00 |

# CASE STUDY #18

## *Cancer*

## SITUATION

Adam was four years old when he had surgery and radiation treatments for a ***brain tumor***. The ***cancer*** went into remission but Adam sustained ***brain damage from the radiation***. The damage resulted in ***impairments in communication, reading, writing, speech and information output.***

Throughout his school career, Adam has struggled with ***written assignments***. He has to exert a great deal of concentration to write and his output is slow and labored. Peer helpers were assigned to him to take notes in class using NCR paper.

Adam has ***an extensive verbal expression*** but cannot translate that to paper. I asked him to spell the word 'positive' and, after reflection, he wrote 'poitive.'

Adam was accepted into the TAP program in high school. He is taking English Honors, Earth Science Honors, Algebra I, Critical Thinking, ESE and physical education. His mother became concerned that he would have difficulty meeting the academic challenges of the program unless he found ways to compensate for his impairments.

The high school has laptop computers, without hard disk drives, that are available in the media center for check out by students. Adam, however, needs certain word processing features, including spell check capabilities, which were not available on the school laptops. Adam was also cautioned that he does not have touch typing/keyboarding skills which present an immediate obstacle to computer access. Adam's mother arranged for him to take typing after school.

While at Epcot in Orlando, Adam and his mother tried several different technologies that were on display. They were particularly impressed with the voice activated units.

Adam's mother was referred to the Children's Services Council [CSC] to secure a voice activated system for use by Adam at home. Contact information and the application form were provided to her.

## CHALLENGE

To let Adam pilot a **voice activated computer system to determine if it is an appropriate tool to facilitate written communication.**

## SOLUTIONS

A voice activated computer rotated back into the ESE Department when its user graduated from high school. The system was placed at Adam's school in the media center. Adam has one ESE class each day that meets in the media center so he has access to the system for one hour on a daily basis.

The vendor was contacted and arrangements were made to upgrade the software and retrain the system to Adam's voice. The vendor also contracted to train Adam on the use of the system.

Children's Services Council, a county tax district agency, approved purchase of a voice activated unit for Adam to use at home.

## ASSESSMENT

Students at the school helped Adam to set up his computer and create his voice file. A computer teacher in the school has also been helpful in providing technical assistance. The mother has read the manual and ultimately had the computer moved to her classroom so that Adam could use it before and after school under her supervision. Training on the device has been scheduled with the vendor.

Adam has been getting B's and C's in his class. A concern is that he still does not ask his teachers for help when he is having an academic problem.

## EXPENDITURES

system recycled from a student who graduated

| | |
|---|---|
| Tandy 2500-sx (80386sx-25Mhz) | $769.96 |
| 120 MB hard drive | $361.13 |
| Video RAM upgrade | $32.00 |
| VGM-441 monitor | $390.91 |
| MS DOS manual | $6.40 |
| Power switching system | $53.45 |
| DMP302 24-pin printer | $386.25 |
| DragonDictate | $5,5 95.00 |

# CASE STUDY #19

## *Stroke*

## SITUATION

Michael developed within all the normal ranges until he was in 4th grade when he suffered a ***stroke*** that resulted in residual impairment on his right side. When Michael returned to school, he was placed in a ***regular elementary class and received minimal consultation*** for occupational and physical therapies. Michael was right handed prior to the stroke. He had to learn to write with his left hand when he returned to school

By 5th grade, it was apparent that Michael had ***difficulty taking notes and keeping up with written assignments.*** In some classes, the teachers provided copies of their notes to Michael. Other strategies were also used but concern developed that Michael would continue to have difficulty keeping pace with his peers. The feeling of the school staff was that Michael needed a tool, such as a laptop, to take notes and do written assignments.

Michael is a quiet young man. He is not assertive and does not like to be the center of attention. He has a slight limp and ***only gross motor movements with his right upper extremities***. The physical limitations are sufficient to attract attention but not severe enough to be obvious. As a result, Michael has sustained, as reported by his teachers and parents, a lot of teasing from his peers.

When Michael entered high school, a note was sent to each one of his teachers to alert them about his condition. This intervention was done after the father notified district staff that most of Michael's middle school teachers had not been made aware of his physical impairments.

Michael has full use of his left hand and could be trained for faster ***left-hand keyboarding*** with right hand finger pointing for support or for two/three key functions. Concern was expressed that even if a laptop was placed for Michael's use, his typing speed would not be sufficient to keep up with the normal classroom pace of learning.

Different strategies were suggested to help Michael improve his typing speed. The touch-typing for the physically impaired software program and Morse Code training disks were provided to his parents.

***Weight*** was another factors that had to be considered. In middle school, Michael was not able to carry his textbooks because he did not have the strength in his hands and arms to carry heavy material for any length of time.

## CHALLENGE

To enhance Michael's **self esteem** by demonstrating to him that educational professionals are interested in providing him with opportunities for success in school.

To provide a system that will enable Michael to produce **written communication** particularly since he faces the unusual challenge of having to change his dominate hand.

To improve Michael's **touch typing skills**.

## SOLUTIONS

A floppy drive laptop was purchased for Michael. HandiCODE software and a switch were also supplied.

Within a year, upgrades in software and hardware resulted in the purchase of a laptop with a hard drive.

## ASSESSMENT

Michael was provided with a number of tools that had the potential of serving as input rate enhancers. He did not develop skill in Morse Code or in touch typing. He continues to use a hunt and peck method of typing which is still faster and more efficient then handwriting.

Despite the best intentions of the Child Study Team and the support personnel who assisted in recommendations, Michael was never comfortable using the laptop in his classrooms. Shortly after receiving the computer, Michael took it home where he uses it to catch up on written assignments and to do homework. Initially this caused a great deal of philosophical debate among educators. The purpose of providing technology to students is to assist their educational program. Michael's choice in how to use the technology did not materialize as expected and there were questions if his choice to use the computer at home was outside our responsibility. In Michael's case, his Individual Education Plan allowed us to consider his unique needs and it was determined that the computer gave him a level of confidence necessary for his success in the educational setting.

## EXPENDITURES

### FIRST SYSTEM -1990

| | |
|---|---|
| Tandy 1100 FD laptop [6 lbs.] | $699.30 |
| Carry case | $27.97 |
| DMP 302 printer | $419.30 |
| 12' printer cable | $27.97 |

### SECOND SYSTEM -1991

| | |
|---|---|
| Tandy laptop 2810 HD | $1749.30 |
| Word Perfect 5.1 | $297.00 |

# CASE STUDY #20

## *Stroke*

## SITUATION / CHALLENGE / SOLUTIONS

Dwight was in 3rd grade in 1987 when he sustained a severe ***cerebral hemorrhage*** in an atrioventricular malformation. Prior to that time, records indicate that Dwight developed normally though some of his family historical records are not available since Dwight was adopted. After the stroke, Dwight received services at a rehabilitation center before being enrolled in 1988 in the only school in the District exclusively for severely handicapped students.

Dwight was one of six students in a class for the physically impaired. There was one teacher and two instructional aides. Dwight was ambulatory when he returned to school but had an abnormal gait with severe balance and posterior trunk abnormalities. He had limited gross and fine motor skills due to ***dystonic posturing*** and was ***severely aproxic and non-communicative***. He also had a slight drool. He continued to get private speech, occupational and physical therapies. These services were also available at school.

Dwight made amazing progress in recovering from the cerebral hemorrhage. Doctors first predicted that Dwight would not live, then, they predicted that he would never walk again. Because Dwight overcame the initial prognosis, his parents became ignited with the assurance that Dwight would return to "normal" in time. Any attempt to assess the reality of Dwight's real performance and productivity was refuted by the family as an effort to undermine his progress. The parents remained adamant that Dwight was continuing to progress on grade level, that he would go to college and graduate school and that he would eventually be independently employed.

When Dwight was first evaluated, post-trauma, it was noted that "He is a bright student with a good sense of humor. He is functioning on a third grade level and is using ...regular curriculum material - somewhat adapted to his communication ability. However, ***all of his academic instruction is done on a one-on-one basis***." It was also noted that "Dwight's major weakness, as far as his academic progression, appears to be the ***lack of self-initiated tasks*** and behavior." The report went on to recommend Dwight be mainstreamed back into a regular elementary school and that an appropriate communication device be provided to prepare him for the mainstream possibility.

Dwight was using a manual communication board throughout the day in a number of different settings. It was noted that Dwight remained a passive interactor and had to be cued to respond to social or academic questions. He did use facial expressions to denote "Yes" and "No" responses and was successful with eye gaze responses but hand signals were unreliable because of limited physical control. His private therapist tried to get him to use a **Vocaid** communication device but was not successful.

During Dwight's first assistive technology evaluation is was noted that "Dwight ***could not attend to a task*** for any measure of time and needed one-on-one intervention/coaching. When on task, Dwight seemed alert and knowledgeable. But more often Dwight was off task and required coaching to re-direct him."

A letter from a clinical psychologist stated, "The evaluation results suggest Dwight has potential somewhere in the low average range at this time. However, the magnitude of his physical handicaps, coupled with his attention and motivation difficulties, ***render Dwight basically unable to demonstrate this potential consistently***. It is my opinion Dwight would be served best in a small, self-contained classroom situation with a teacher familiar with the instructional needs of special students."

In September, 1989, Dwight's parents purchased a **Touch Talker** AAC device with MiniSpeak software after an ACCESS Team evaluation stated it MIGHT be a useful tool for communication.

In 1989, after extensive meetings and interventions, Dwight was transferred to his home school. Within a very short period of time, significant problems materialized. Dwight's teacher, who had taught him before the stroke and had kept in touch with him, had been reluctant to have him return to the mainstream. ***She had observed him at the school for severely handicapped students and felt his "on-grade level" performance was exaggerated because the setting was far removed from a regular classroom.*** Written communication, for example, was accomplished by the teacher ***holding her hand over Dwight's hand.***

The regular teacher's classroom was very crowded. Dwight had to be positioned in a corner of the room because of his need to access electricity and because of the massive amount of hardware that accompanied him. A ***tutor companion*** assisted Dwight but he was not able to maintain either the pace or productive level of his peers.

School personnel kept a record of Dwight's behaviors including the number of times he wet his pants and the number of times he was off task. The mother's response was, "They don't do that for every student, why Dwight?" She also complained that Dwight had up to sixty, two-digit addition/subtraction problems to do at night to keep up with the work expected of his peers. Dwight's mother felt that if he could do a few of the problems correctly he should not have to do the rest of them. Dwight was failing all his spelling test and was disciplined for not having his homework completed.

Dwight's parents blamed the school personnel for the failure of Dwight's transition. They immediately went "shopping" and selected a school 30 miles from Dwight's home which they said had an appropriate program. Dwight's mother agreed to transport him back and forth from home to school and the District approved the transfer. Dwight was now in a class for the physically impaired with occasional mainstreaming to peer-appropriate activities. He continued to receive "A's" and "B's" in his academic work which was said to be on grade level.

Although Dwight was ambulatory, his growth began to affect his stability. His parents supplied a motorized, three wheel vehicle which Dwight drove with great difficulty. He had to be prompted to drive the vehicle and someone had to be beside him at all times because he never drove it in a straight line down the hall or sidewalk.

Dwight's ***tutor companion*** became a personal friend of the family and reported all activities, conversations and strategies that school personnel attempted with Dwight. If the parents disagreed with the information told them by the ***tutor companion***, they immediately called the teacher, principal and District personnel.

In December, 1989, the parents finally concurred with District and school personnel that the **Touch Talker** was not an appropriate communication device for Dwight. Dwight's parents requested reimbursement for the used device at a depreciated cost to the District of $2,895.00. Board approval was obtained and the Touch Talker was purchased by the District so that it could be assigned to any needful student. Initially, it was assigned to Dwight.

Within a year, Dwight's parents contacted an attorney and instituted procedures to have the District repay them for transporting Dwight from his home to the school of their choice and to immediately institute bus transportation even though Dwight would be the only student on the 30 mile bus ride. It should be noted that an appropriate program was available in Dwight's residential area but the parents rejected it. The parents were reimbursed for mileage and bus service was initiated.

In 1991, the parents had a private doctor write a letter stating Dwight needed a more appropriate augmentative communication system. The letter also said that Dwight had above normal intelligence. In 1991, at the request of the District, staff from the Communication Systems Evaluation Center [CSEC] did an on-site evaluation of Dwight. Because of the complexities of his case, the staff recommended a full evaluation at the CSEC facility in Orlando.

In 1992, the District paid for Dwight and his family to go to Orlando so that Dwight could participate in a full CSEC evaluation. Dwight had grown considerably from the time he first returned to school. CSEC noted, "His muscle tone fluctuated and he often postures into an overly straightened (hyperextended or almost opisthotonos) position when sitting and standing. He cannot automatically assume or maintain trunk righting, mature weight shifting, or equilibrium reactions. ***In spite of this, he walks limited distances, but is neither stable nor safe doing so."***

CSEC also reported "After working intensely with Dwight for several hours, CSEC examiners feel strongly that he demonstrated many seizure-like episodes which interfered significantly with his motor, social, and cognitive performance." They described behaviors consistent with ***three different types of seizure activities.*** Dwight's mother reported he was taking Tegretol (250 mg three times per day) but that the doctor was considering changing him to Dilantin or possibly Sinmet and she felt the seizures were totaly under control.

CSEC was unwilling to make a specific AAC recommendation because "his response rate varied so greatly (due to seizure-like episodes) and interfered with his performance." They also documented ***fatigue behaviors*** evident within two hours of starting to work with Dwight and resulting in increased seizure activity and a decline in productivity.

Dwight's parents again choose the program he would enter for middle school and again the selected school was 30 miles from home. The District continued to provide bus transportation to and from the school. David had now grown to full stature and he was quite tall. The abnormal gait with severe balance and posterior trunk abnormalities became critical safety factors and Dwight began using a wheelchair at school for mobility.

In 1993, a staffing report stated, "***Tutor companion demonstrating a lack of awareness of appropriate boundaries for effective and realistic instruction***." As preparations were made for Dwight to transition to a high school in his residential area, one determining factor was that a new tutor companion would be assigned to Dwight.

The middle school staff was also repeatedly cautioned to document:

- -number of sentences written within a timed period.
- -number of promptings required to get productivity from Dwight.
- -number of math problem completed within a timed period.
- -number of interventions required to get productivity from Dwight.
- -number of communications initiated by Dwight.
- -number of communication responses given by Dwight.
- -level of communication responses given by Dwight. [one word, complete sentence, etc.]

However, the middle school staff failed to supply sufficient documentation. Meanwhile, Dwight continued to get "A's" and "B's" for "grade level" class work completed with the assistance of his tutor companion.

Preparations for Dwight's transition to high school were intensive. More than five meetings were held that lasted from two to four hours involving at minimum of twenty people. The parents, with attorney present, demanded a tilted table for each class since Dwight would now be fully mainstreamed; they demanded he get a regular diploma; they demanded a DynaVox be ordered and in place before the start of school; they demanded a new computer although that request was denied because of the availability of other equipment in the school; and they demanded tapes of all his textbooks be available at the start of school. Between April and August, the attorney wrote several letters which required extensive staff time to research answers.

Despite the tension, Dwight did start high school and has made a moderately successful transition. He continues to get satisfactory grades for regular credits although his behaviors, attention and seizure activities have not changed from those initially reported in 1989.

## ASSESSMENT

Dwight has presented one of the most complex challenges ever encountered in the District. Many of these challenges reflex the parent's expectations that the correct educational program combined with the correct technology would make it possible for Dwight to perform competitively with his peers.

The parents have consistently denied the extent of Dwight's injuries. They believe that he is functioning within normal range and have consistently reported the wonderful and extensive work he does at home. They have never understood why reports about Dwight's productivity at school do not match their assessment of his performance at home.

The IEP has allowed for extensive modification of Dwight's academic program allowing him to achieve high grades for work that is significantly below the minimal standard expected of his peers.

The most difficult aspect of the case is that personnel involved with Dwight for the past seven years, feel the parent's report of progress and advancement is built on a false foundation. That a realistic assessment of Dwight's strengths and limitations would result in a healthier and more cooperative climate for long-range planning in Dwight's best interests.

The DynaVox has provided Dwight with the most effective communication tool to date but he still does not initiate communication and only responds with short answers. Dwight has never composed a complete sentence [in the school environment] without assistance.

## EXPENDITURES

### FIRST SYSTEM -1989

| | |
|---|---|
| TouchTalker | purchased by parents |
| Diconex printer | |
| Apple IIGS | $1,348.94 |
| ImageWriter printer | $411.08 |
| Adaptive Firmware Card [Exceptional Computing] | $500.00 |
| Echo IIB speech synthesizer [Street Electronics] | $109.95 |
| Unicorn Expanded Keyboard [Exceptional Computing] | $307.00 |
| Unicorn keyguard 128 holes | $79.00 |

### SECOND SYSTEM -1991

| | |
|---|---|
| Real Voice | |
| membrane cover | $35.00 |
| Repair of Real Voice [damaged at a summer camp] | $350.00 |

### THIRD SYSTEM -1994

| | |
|---|---|
| 7 Adjustable Height Tilt Top Desks | $309.95 EACH |
| DynaVox - [SST-ACS] | $5,909.00 |
| includes DynaVox SynaSyms with 2000 pics, 1 MG upgrade and wheelchair mount [$579.00] | |
| DynaWrite card upgrade | $500.00 |

# CASE STUDY #21

## *Speech/Language - Hearing Impaired*

*By Laura Seligman, AAC Program Planner*

## SITUATION

[Laura Seligman was a Speech/Language teacher in a high school when this situation occured.]

Samantha exhibited a ***bilateral severe to profound sensorimeural hearing loss*** of unknown etiology. Although Samantha was a candidate for hearing aides, she chose not to wear them. Initially, Samantha was enrolled in a residential school for the deaf and was transferred to a mainstream elementary school in a Hearing Impaired program when she was 9. Later, at the request of her mother, Samantha again returned to the school for the deaf. Samantha's mother felt her adjustment and progress were "better" at the school for the deaf.

A WISC-R, initially administered at age 6, yielded a Performance Scale IQ of 84. With intellectual abilities appearing well above her initial test results, the WISC-R was readministered at age 11 and Samantha attained a Performance IQ score of 104. Problems with organization of thought and distractibility were noted but these did not appear to have a major impact on her learning. She continued to be a self-motivated student with a positive attitude toward learning.

Samantha was eventually enrolled in mainstreamed middle and high schools where she spent part of her day in a class for the Hearing Impaired and the remainder of her day in regular classroom settings. She was also enrolled in Speech/Language Therapy.

Throughout her primary, intermediate and secondary grades, Samantha exhibited slightly below level skills in the areas of Reading Comprehension and Math Application according to standardized measures, but was consistently very successful in the classroom. She passed all the requirements to receive a regular High School Diploma in the State of Florida.

Samantha used ***Total Communication*** throughout her schooling. Total Communication includes the use of American Sign Language, speech, gestures, lip reading and so forth. This system worked effectively for her. Listeners unfamiliar with Samantha's Total Communication system, found Samantha very difficult to understand. She was assigned an ***interpreter*** during her school day. The interpreter would interpret speakers to Samantha as well as voice Samantha's expressive communication.

## CHALLENGE

Speech therapy was initiated when Samantha was in middle school. At that time, Samantha was minimally intelligible if she used solely oral means. Errors were noted on all nasal consonants (m, n, ing), on sound requiring stridency (s, sh, ch), and on sounds requiring intra-oral air pressure (p, t, k, g). In addition, inconsistent correct productions were noted on l and r. Most notable was her inability to use appropriate suprasegmental features (pitch, inflection, rate, rhythm, and volume) in isolated and connected speech contexts. These factors all greatly impacted intelligibility.

Use a technology that provides a **"visual" of speech patterns** so that Samantha can "see" her own speech for the purpose of **imitating model speech patterns**. The performance outcome is to move toward **more intelligible speech for oral communication.**

## SOLUTIONS

Speech therapy interventions, when initiated during high school, incorporated the use of the computer with the Video Voice Speech Training system. Video Voice is specialized software and hardware (speech analyzer, microphone, and an A-D conversion card). Throughout Samantha's four years in high school, this system was used as an integral part of her speech therapy.

The Video Voice program enabled Samantha to view visual images of her speech parameters of articulation (pronounciation), pitch, amplitude, and thythm. The program maintained a file with speech models that Samantha could try to match during her sessions. The program offers a different drill and game formats so that Samantha experienced a variety of activities in a therapeutic context. Samantha's progress could be traced through the data collection component of the software.

Samantha was enrolled in a daily Speech Therapy Class with four other hard of hearing and deaf students. Weekly cycles of speech targets were remediated using visual, kinesthetic and tactile means to elicit improvement.

## ASSESSMENT

Prior to her use of the Video Voice, Samantha had no understanding of speech parameters of pitch, loudness and rhythm. Her speech was very unintelligible due to misarticulation (mispronounciation) of sounds. Due to her deafness, Samantha had no auditorily provided models to give her feedback on her own speech patterns. With the use of Video Voice, Samantha had visual feedback of her own voice and, for the first time, she could self-monitor her own progress. Samantha could now "see" pitch where she had never been able to hear it before. Likewise, she was able to "see" sounds and patterns of co-articulation (connected speech production). This was the initiation of significant changes in Samantha's speech patterns.

Samantha's level of intelligibility increased from being minimally understood by a stranger to approximately 90% intelligibility with unfamiliar listeners. Samantha's continued to maintain that her personal goal was to be able to communicate effectively with the hearing world. By her Senior year in high school, she sated that she felt very comfortable in communication environments with hearing people (without an interpreter). She began to develop strategies to repair communication breakdowns, and with the help of the Video Voice, she was able to monitor her own progress.

Samantha is presently enrolled in a local community college.

## EXPENDITURES

| | |
|---|---|
| Video Voice with Sound Blaster Pro [Micro Video] | $2,995.00 |
| DOS-based computer syste | provided by school |

# CASE STUDY #22

## *Traumatic Brain Injury (TBI)*

### SITUATION

Andrew is a fifth grade student who sustained a ***closed head injury*** a year before a Child Study Team requested a technology evaluation. Andrew was stepping out of a boat when he slipped on the dock and hit his head. He experienced a skull fracture over the left temporal region and a related basal skull fracture. Subsequent to the injury, ***short and long term memory*** problems associated with head injury were manifest. Andrew also experienced some subtle personality changes as well as episodes of ***frustration*** over his inability to complete tasks that were once familiar to him. Other post injury problems that developed included frequent stomach aches, fears and nightmares. Speech, mobility, gross motor and fine motor skills were not affected by the injury.

Andrew was enrolled in a private school prior to the accident. After treatment, he returned to the private school but began experiencing academic difficulty.

Andrew's parents engaged a clinical psychologist to perform a neuropsychological assessment. The psychologist documented a decrease in performance and stamina during each of the three sessions needed for Andrew to complete the test. He also noted low frustration tolerance and poor compliance when the test items became difficult for Andrew and suggested that a comprehensive rehabilitation plan for Andrew must address those factors. The test also revealed visual-perceptual, visual motor and visual memory deficits.

Additional testing documented that Andrew was loosing 50% of what he learned within 20 minutes and 98% was lost by the end of a day. The second psychologist recommended computer instruction to let Andrew progress at his own pace and possibly enhance memory retention.

Andrew's parents then enrolled Andrew in the public school system in order to ensure his eligibility for a 504 Plan. A total of 36 modifications were identified for Andrew's education program. Other services were also requested including a technology evaluation.

Andrew was not classified as an ESE student at the time the technology evaluation took place. Andrew did not have any of the characteristics common to students considered for assistive technology. He is mobile and verbal. He has a neat handwriting and basically functions on grade level. But the behaviors resulting from the brain injury could not be ignored and it was felt that Andrew should be given the opportunity to use technology as a means of exercising, and hopefully strengthening, his short and long term memory. Since Andrew was only one year post trauma, there was every reason to believe his condition would continue to improve, however, steps were taken to ensure Andrew was declared eligible for services for a student with physical disabilities. [Necessary for access to 94-142/IDEA funding used for assistive technology.]

### CHALLENGE

To pilot the use of a computer with Andrew as a means of exercising, and hopefully **strengthening, his short and long term memory.**

## SOLUTIONS

A laptop computer was placed for nine weeks. A district learning resource teacher, who worked with Andrew several times a week, agreed to document Andrew's progress. In March, the team would reconvene to evaluate the effectiveness of the computer as a tool for Andrew to use in the classroom.

## ASSESSMENT

Within 9 weeks, the following report was compiled: "Andrew's long/short term memory are improving. Andrew is using the computer daily. Since working with the computer and Ms. Andrews [district learning resource teacher], Andrew has become more organized. He is able to determine when it is better to use the computer or write assignments out by hand. The amount of work completed at school has increased since using the computer. Frustration level has dropped."

Based on the report, Andrew was assigned use of the laptop for the remainder of the school year. The following fall, Andrew returned to private school. His parents provided a laptop for him to use at school.

## EXPENDITURES

| | |
|---|---|
| Macintosh PowerBook | [recycled from another student] |
| ImageWriter printer | [recycled] |

# CASE STUDY #23

## *Muscular Dystrophy*

### SITUATION

Michael received his first tech evaluation in 1989 when he was in the first grade. Michael has a severe neuromuscular disorder called ***Spinal Muscular Atrophy*** with a progressive prognosis. Since the time Michael entered the public school system, he has worn a body jacket that is maintained in place by a hook system in his motorized wheelchair because he has no trunk control. Michael is very articulate. He writes using a felt tip pen which he holds very loosely. Michael does not use a pencil or pen because he ***cannot exert sufficient pressure*** to make his writing legible. ***Fatigue*** was a major concern for Michael when he tried to produce written communication.

During the first evaluation, Michael accessed the computer keyboard using the pointer finger of his right hand. He was not able to use his left hand because he had less control and it was too weak. Adaptations were needed for multi-key keyboard functions. When asked to type the homerow keys from right to left: a s d f g h j k l ; [keys are arranged as they appear on the keyboard], Michael began having difficulty when he reached the "h" key. His head fell to the right side as he reached for the key and Michael was not able to correct his head position without assistance. Michael had to stop typing when he reached the "f" key. He was ***not able to cross mid-range*** so the left portion of the keyboard was inaccessible to him unless the keyboard was positioned on his right side. Michael was tested on an Apple IIe located in the classroom. The Apple IIe had a built in keyboard that could not be positioned.

Throughout his education program, Michael has been ***mainstreamed*** into regular classes. In elementary, he spent one hour each day in the class for students with physical impairments. While in the PI class, he received occupational and physical therapies and worked to complete class assignments. During this time, he had access to computers in the classroom. A ***tutor companion*** was also assigned to Michael to help him with eating, bathrooming and academic work.

During the 1991-92 school term, Michael's ***physical abilities deteriorated***. He could no longer turn his motorized wheelchair on or off. Nor could he maneuver the joystick controls on his wheelchair and he began to have difficulty accessing the computer keyboard. Michael could not lift his arm or wrist. He could move his hand by sliding it over the surface of a desk. While he continued to have control in the fingers of his right hand, he got false hits on the keyboard because his wrist would interfere when he tried to activate keys on the top two rows of the keyboard. The Apple IIGS no longer met Michael's needs because he now required a ***portable*** system that would be available as needed.

In 1993, Michael was re-evaluated after reports were received stating that Michael had lost strength in his arms, hands and fingers and could no longer access the penta switch. Michael was interviewed and several things became immediately apparent. Michael did have the dexterity and strength to use the keyboard and switch for data input. Michael was very concerned about imposing on his father who became the custodial parent after a divorce in the family. And, Michael had strong, rebellious feelings that were directed at his tutor companion.

## CHALLENGE

To provide Michael a tool for written expression. The tool should:

- be **controlled with one hand**.
- require **little pressure** to activate.
- be **programmable to perform multi-key functions with a single activation**.
- have **rate enhancers** to help Michael manage his endurance and fatigue.

As Michael's physical abilities deteriorated, new issues had to be considered including:

- **voice output** so that physical energy did not have to be expended for written communication.
- **portability** so Michael had access whenever he needed the tool.

## SOLUTIONS

An Apple IIGS with a separate keyboard was placed in Michael's class for the physically impaired. The Apple IIGS was adapted with an Adaptive Firmware Card [AFC] and an Echo Speech Synthesizer. Michael was introduced to Morse Code, an option in the AFC setup menu. He also choose to not use other AFC options, such as scanning, because he was more efficient on the keyboard.

In 1991/92, Michael was provided a laptop computer adapted for switch input. The switch controlled an alphabetic scan coupled with word prediction.

In 1993/94, voice activation was added to Michael's system.

## ASSESSMENT

Initially, Michael preferred using the regular keyboard on the Apple IIGS. He never seriously pursued the Morse Code input system.

Michael's physical condition deteriorated dramatically by the time he was in the third grade. A divorce in the family and the diagnosis of muscular dystrophy in Michael's brother added greater stress to the situation. Michael demonstrated belligerent behaviors during this time. He became increasingly demanding of his tutor companion. He kept insisting he could do things and said the tutor companion was supposed to help him do his assignments. The tutor companion expressed her own frustration about Michael's lack of follow-through. She complained that Michael did not finish his Science Fair project despite the fact she went to great lengths to ensure his success. She also said he had quit doing any homework.

Michael complained regularly about perceived technical problems in the new laptop. He preferred dictating to the tutor companion but, after accessing the situation, it was determined that Michael was engaging in manipulative behaviors and he was counseled to use his computer system again.

Michael did complain about the slow speed associated with the EZ Key scan. This complaint was valid since Michael's mental abilities far exceed the speed of his written output. The discrepancy was so great that consideration was immediately given to a voice activated system. Coupled with the multiple factors under consideration was the knowledge that Michael would enter middle school in 1994/95. It was felt that Michael would get more personalized attention and training on a voice activated system placed during his last year in elementary school.

Problems with the software peripheral used with the DOS-based scan program, caused the team to approve the voice activated system in Mac format. Michael required only minimal training to become proficient on the voice-based system.

In 1994, a report from the Occupational Therapist indicated that Michael had taken the laptop home and was refusing to use it in school. The OT was making efforts to get Michael to bring the laptop back to school. When Michael does use the computer, he prefers to use the keyboard rather then the voice activation. It is generally believed among the service providers, that Michael's reluctance is a form of "adolescent rebellion" combined with a form of "denial" at the continued decline in his physical condition. The approach will be to continue to work with Michael in an encouraging manner, but not to pressure him. He is the key decision maker in how best to use his tech tools.

## EXPENDITURES

### FIRST SYSTEM - 1988/89

| | |
|---|---|
| Apple IIGS Teacher Desktop System [includes printer] | $1,964.03 |
| ImageWriter printer | |
| Adaptive Firmware Card [Don Johnston*] | $490.00 |
| Echo Speech Synthesizer [Street Electronics] | $123.50 |

*Patent rights to the Adaptive Firmware Card were sold to the Don Johnston Company which is listed here. The AFC however, was bought from a different source in 1989.]

### SECOND SYSTEM - 1991/92

| | |
|---|---|
| Safety Rehab Tray [Action Mobility] | $360.00 |
| Stabilizer bracket [Action Mobility] | $136.50 |
| Tandy Laptop HD 2820 | $1,749.30 |
| DMP 24-pin printer | $419.30 |
| 12 ' cable | $25.16 |
| Enhanced keyboard | $69.96 |
| EZ Keys [Words+] | |
| Penta Switch | |

### THIRD SYSTEM - 1994/95

| | |
|---|---|
| Mac PowerBook 160 4 MB 40 HD | $1,986.00 |
| Co: Writer (ACS) | $290.00 |
| Voice Navigator (ACS) | $399.00 |
| Claris AppleWorks | $169.00 |

## Vignette 1

Tong is twelve years old and recently arrived in the United States to live with his grandparents. Tong is from Thailand where he had one year of English before coming to Florida. No school records are available, but Tong's psychological test scores are low so he has been placed in an SLD class for his English instruction at Mirror Lakes Middle School. Tong also receives ESOL support.

Tests show that Tong is reading at a 2nd grade level, but in conversations, you notice that Tong is very articulate when discussing a subject with which he is familiar.

There is one computer and printer in Tong's SLD class. Generally 12 students are in the class at the same time Tong is there.

While an engaging student at first, Tong is now subject to rapid mood changes and sudden sleep onset. He seems distracted, slow, and has developed a low frustration tolerance.

**CHALLENGE:**

Your challenge is to develop strategies that will help Tong regain his confidence and find success in his school work.

Include in your strategies, software titles and computer-related activities that will help Tong expand his English vocabulary.

# Vignette 2

Mr. Edwards has been teaching History in high school for 25 years. Next year, all history classes will get a computerized Integrated Learning System (ILS) complete with CD ROM, laser discs and telecommunications. It will replace the traditional textbook.

Each history class will also receive five networked computers and one printer. The ILS has a management system built into the software that tracks student performance on the software but, members of the department have expressed concern that skills mastered on the computer may not transfer to other applications and activities.

The integrated learning system is arranged in thematic units around the different periods in U.S. history. It includes multiple databases for each unit. There are timeline functions and multiple simulations that students can work on independently or in groups. The CDs and laser disks contain speeches, movie clips, re-enactments and commentaries. There are also comprehension sections, with a great deal of text, that the students must read in order to answer questions. A scratch pad and word processor are available throughout the program for students to use as a tool.

Members of the department are scheduled to have three full days of training on the ILS. The training will include reviewing the presentation of the lessons, using the manuals and support material, setting up the peripheral hardware such as the laser disk player, customizing the management system with each teacher's class roster, reviewing the curriculum objectives and generating progress reports.

Mr. Edwards does not own a computer and has never used one at the school. He has a three-ring binder that holds the notes he uses each year to conduct his history lectures. He has a file cabinet neatly organized with worksheets, maps and tests that accompany each historical period. His files and support materials are legendary. So is his attitude. Mr. Edwards has been overheard many times saying, "My job is to teach. The student's job is to learn."

Mr. Edwards has also learned that next year all his classes will include SLD and EH mildly handicapped students. His average class size is presently 35 students and the projection is for classes to be slightly larger next term.

The ESE teachers have not had many dealings with Mr. Edwards, but they have heard that he is very angry and frustrated about the expected changes the computers will bring to his instructional style. He is equally agitated about having ESE students in his class.

## CHALLENGE:

You are an ESE teacher with a new instructional role. In some classes you will now engage in cooperative teaching. In other classes, you will be providing consultative services to ESE students included in regular classes.

Your challenge is to schedule a meeting with Mr. Edwards during which you will help him work out strategies to cope with changes coming to his classroom. Include in your strategies, suggestions for scheduling students on the history integrated learning system.

## Vignette 3

Mrs. Daisy Wheeler is the department head for a middle school business education department. She and Mrs. Sterling have been teaching all of the business education courses for the last ten years. Most courses are on a 9-week wheel, but some of the application courses last for a full semester.

Both teachers have recently incorporated computers into their curriculum. They use a textbook to review computer vocabulary and concepts. Worksheets are reviewed together in class with the aid of an overhead projector. Then, the students are sent to the computers to work individually on tutorials before practicing on the software application. The tutorials hae a great deal of text on each screen. The text is on a middle school reading level. Each student must produce a product using the application program as 25% of his/her chapter exam grade. The classes are kept on a brisk schedule.

Mrs. Wheeler and Mrs. Sterling both tend to use a similar response whenever approached about ESE students in their classes. They smile, nod a lot, and then ignore everything that has been said.

Mildly handicapped students tend to have a tough time in these classes. They can't keep up with the work, have difficulty understanding the material, are constantly being sent to the assistant principal for discipline, skip classes and act out regularly.

### CHALLENGE:

Your challenge is to meet with Mrs. Wheeler and Mrs. Sterling to design strategies that will enable greater success for ESE students in these classes.

# Vignette 4

Henry is 12 years old and has been in the public school system since kindergarten, but he has spent almost as much time on homebound instruction as he spent has in the classroom. Henry has cerebral palsy. He is an only child and the household arranges itself around Henry's perceived needs.

Henry tested into the Gifted program in 2nd grade but some learning disabilities also began to manifest themselves at that time. As Henry advanced in age, his difficulties with spelling and reading became more and more pronounced.

Henry was provided with an Apple IIe computer, printer and Magic Slate software for use in the Gifted classroom. He was making progress in keyboarding skills and written composition though the teacher noted she had to spend an inordinate amount of time motivating Henry to complete assignments. He was assigned a tutor companion to help with class work and mobility. Henry uses a manual wheelchair.

Between 2nd and 3rd grade, Henry was scheduled for surgery on his hip. His mother requested he be placed on Homebound during the recovery period. The computer was moved to Henry's home to assist him in maintaining skills. Prior to the surgery, breathing complications, compounded by allergies, were diagnosed by the physician. Treatment was initiated and surgery was postponed for a year. Henry stayed home for almost two years before his mother was pressured to encourage his return to school.

A site visit was conducted prior to Henry's return to school. Henry was in his bed. The bed was situated in the middle of the living room. He was watching TV and was the obvious controller of the remote. During the site visit, the remote finally had to be taken from Henry when he continued to turn the TV on because he was missing a show he wanted to watch.

Henry complained that the computer didn't work. He couldn't remember the arrangement of the keys on the keyboard. When the Specialist tried to converse with Henry's mother, Henry repeatedly interrupted with comments, demands and directions. At one point, he kept making demands for food. His mother brought him several cookies which Henry stuffed in his mouth getting crumbs all over the bed and himself. His mother ran to get a wash cloth to wipe his face and hands. Henry is considerably overweight which has aggravated his medical condition.

When asked to perform a task, Henry repeatedly said, "I can't do it." and would demand his mother help. His mother made numerous excuses for him and expressed concern that Henry did not know initial sounds, had never been taught phonics and therefore, was not able to spell. Henry does have a very creative imagination and is very verbal. He likes to dominate a conversation. His comments reflect both insight and inexperience.

## CHALLENGE

Henry will be returning to school in March. He will be placed in 5th grade at his old elementary school so that he has time to adjust before transitioning to middle school. A new Individual Education Plan [IEP] will be written at that time. What goals and objectives would you recommend? How can the computer be used most effectively to augment Henry's education? Should his system be upgraded to a Macintosh at this time? Include implementation plans for computer activities and software in your recommendations.

# Vignette 5

You are a 4th grade teacher. You have 37 students in your classroom. The District has just placed an Integrated Learning System (ILS) in your class. The ILS reviews discreet skills but has the potential for use in thematic units if you know how to set up the configuration file. You are pretty new to the world of technology.

The set up in your classroom consists of four networked computers and one printer. You had training on the software components and the management system. Your directions are to ensure every student in your class is on the computer 20 minutes a day, 10 minutes for language development and 10 minutes for math computations. Because of your class enrollment, and blocked time for lunch and specials such as art, music and physical education, you must start students on the ILS first thing in the morning and schedule groups of four throughout the day.

You have a regular class of 4th graders. One student is physically impaired with some fine motor impairment. She has difficulty using the mouse. She is in a wheelchair. Four students have mild handicaps. Three of those students are not presently reading on grade level. And, two of the students have particular problems with computations. Among other skills, they have not mastered the multiplication tables. Another group of three students use English as their second language. You frequently have to define vocabulary for them to help them understand the concepts related to a subject. Another student has emotional problems. ESE teachers are scheduled daily to provide in-class consultation to the students with disabling conditions. The rest of your class are presently functioning in three different reading groups.

Your classroom is already crowded. Each student has an individual desk. You have two long tables to use for learning centers, group work and craft projects. You have a teacher's desk and a file cabinet. And there are the four computer carrels and the printer stand.

You have been trained in the Florida Performance Management System [FPMS] which evaluates a teacher's effectiveness during direct instruction and interaction with students. You have developed successful teaching strategies using this system but now feel concerned that students on the ILS will miss the direct instruction you are providing.

**CHALLENGE**

How can you arrange your class schedule and environment to maximize the learning environment for all your students?

What teaching strategies and techniques should you use to help all students learn?

# Vignette 6

Chad is a middle school student with physical impairments. He uses a wheel chair but he does have full control of his upper extremities. Chad has access to computers in his classroom but he seldom uses them. A tutor companion was assigned to Chad when he was in the 1st grade. Since that time, Chad has had use of that service but he has had a different tutor companion every year. Each one refused to work with Chad for more then one year.

Chad prefers to dictate all of his written work. If he is required to do any writing, he whines that it is too hard and it makes him tired. Chad likes having an adult at his command. If the tutor companion is helping the teacher or talking to another student. Chad will interrupt or begin asking for something. He has been observed deliberately knocking items off his desk to attract the attention of the tutor companion.

The tutor companion feels harrassed because she would like Chad to do more things for himself. The teacher strongly agrees that Chad should be much more independent and is capable both mentally and physically of doing the work in class.

In the past, Chad's parents have been very defensive if they felt anyone was trying to pressure their son. They do not want Chad to have any homework. They feel he needs to rest. Attempts in the past to diversify the role of the tutor companion in the classroom have met with stiff resistance. The parents want the tutor companion to stay with Chad and do everything he requests.

## CHALLENGE

A parent conference is scheduled. You will be discussing the upcoming three-year IEP re-evaluation. You would like to brainstorm long term expectations for Chad [who is capable of going to college] so that realistic goals and objectives can be formulated. A major purpose of the conference is to discuss the role of the tutor compansion in Chad's academic program.

Develop strategies on how to approach the parents in discussing this sensitive issue.

# Vignette 7

Barney is a bright young student who has Cerebral Palsy. He is in 5th grade and will transition to middle school in the Fall. He attends regular classes but receives consult services from Exceptional Student Education. Barney is assigned a tutor companion, Beth, who has been with him since second grade. Beth helps Barney with all written work since he has some fine motor impairment.

Barney and Beth are very close. They have been together for so long that Beth anticipates many of Barney's needs without him even asking. She often answers questions for him even though he is verbal and can speak for himself. Beth feels that helping Barney is a special calling in her life and she is very proud of her service.

Beth has become a personal friend of Barney's family. She and her husband often socialize with Barney's parents and she talks with Barney's mother by phone on a daily basis. Beth and her husband sometimes keep Barney at their home on week-ends or evenings when Barney's parents have an engagement or just need a respite break.

School staff are well aware that they have to be very careful about what they say in front of Beth. On numerous occasions, their words have come back to haunt them in the form of complaints from Barney's mother.

Barney normally gets A's and B's in class. If he gets a C, his mother calls the principal and the area office to find out "why the teacher didn't modify the curriculum to meet Barney's needs." Recently, a video tape was made of the students in Barney's class.

**CHALLENGE**

You are reviewing the video which is focusing on a group doing independent study. Barney happens to be in the group but he is taking a make-up test being administered by Beth. You notice several factors about Beth's body language and voice inflection that cause you to rewind the tape and view it again.

Beth: The next questions reads, The capitol of Peru is: a) Caracus; [voice inflection increases] **B) Lima** or c) Bolivia?

Which is the answer?

Barney B

Beth That's right. Good for you.

Okay, this next part you need to mark with your magic marker. You need to use the yellow color to identify Argentina. Wasn't that nice of your teacher to make up these special maps for you? Now which one of those countries down there are Argentina?

[Barney begins to move his marker over the page.]

Beth Ooops, now you may want to think about it for a minute. You want to be sure and get the right one.

[Beth is biting her lip. As the marker passes over Argentina she sits a little straighter, draws in a deep breath and raises her eye brows..]

[Barney marks Argentina with the yellow marker.]

Beth That's right. You must have studied hard last night.

You stop the video. You have suspected for a long time that much of Barney's work is actually done by Beth. You feel that Barney is capable of doing the work on his own but you know that he is slower then his peers because of his physical disabilities. You feel that Beth, unintentionally, is actually hurting Barney's academic progress.

What should you do?

# Vignette 8

Jake is a 7th Grade student. When he was in the 4th grade, he had a severe stroke resulting in partial paralysis, seizure activity and loss of speech. Jake's initial prognosis had been very poor. His unexpected progress in the first three years following the stroke, caused his parents to anticipate a full recovery.

Jake is mainstreamed. He uses an adapted computer with word prediction software for written output. His textbooks are provided on tape. He uses a DynaVox for oral communication. He has an electric wheelchair and he is assigned a tutor companion to assist with eating, bathrooming and academic work.

Since the stroke, Jake has seldom initiated any communication. Responses to questions directed at him are always short and often incomplete. In school, he has never composed a complete sentence using any of the available tools.

Jake recently turned in a term paper for English class that was six typed pages. It contained a bibliography, footnotes and other stylized requirements. The teacher had waived those requirements for Jake because he had observed the difficulties Jake had trying to type in class. The term paper was completed at home. The teacher talked to the mother who radiated enthusiasm for the wonderful work Jake did at home. She was so proud that she only had to help him a little bit.

**CHALLENGE**

How do you grade Jake's term paper?

## Vignette 9

Crystal is a darling little girl that everyone adores. She is in 1st Grade. She has severe CP and is non-verbal but she has a beautiful smile and a bright sparkle in her eye. Crystal has a beautiful pink wheelchair. Everyday, her mother dresses her in color coordinated outfits with hair ribbons and socks to match.

Crystal uses a lot of energy during the school day. The lack of motor control and increased tone make it difficult for her to point to communication symbols or objects. She has an instructional aid, Daisy, assigned to her during the day.

Daisy adores Crystal. She is eager to be helpful in every way possible. Just the other day, ice cream cups were delivered to the class as a treat. The teacher, in anticipation of the event, had made a communication board with symbols for vanilla, chocolate, and strawberry. A parent volunteer was distributing the ice cream. When she got to Crystal, the volunteer said, "What kind of ice cream would you like to eat?" Crystal started to respond on her communication board when Daisy answered, "Oh, she likes chocolate." Crystal dropped her hands and smiled.

Fortunately, the teacher overheard and knew that Crystal was allergic to chocolate. She immediately intervened and asked Crystal to choose between vanilla and strawberry.

Later in the day, the teacher scheduled learning center activities. As the students rotated to each center, they had the opportunity to choose which activity they wanted to do. Thematic communication boards were created for each center. The teacher had a note from Crystal's mother saying the family had just returned from Disney World where they had purchased a copy of "It's a Small World After All" because Crystal enjoyed the ride so much. The teacher had included the song in the Music Center activity. But, when Daisy took Crystal to the Music Center, she heard Daisy say, "Alright, which song would you like to play? I know, Shake It A Baby is your favorite isn't it! Well I'll just play that right now."

Finally, toward the end of the day, the teacher gave a brief quiz. One question asked the students to "write" the date, including the day of the week. Daisy had been out of the room when the class practiced the date as Tuesday, October 14. When the teacher looked at Crystal's paper it said, Wednesday, October 15. The teacher was puzzled. Then, Daisy came rushing up. "Today is Wednesday, October 15th and I've got to run to the bank to pay my car loan. Can I leave a few minutes early?"

**CHALLENGE**

Daisy is only trying to be helpful but she is creating a co-dependency situation that will have long term effect on Crystal's ability to make decisions. Crystal's "learned helplessness" will could become ingrained if the patterns are not changed.

What can you do?

# Vignette 10

Melvin had a stroke and is now physically impaired and non-verbal though the long-term prognosis offers some hope that partial speech will return. He depends on his tutor companion to get him to class because his electric wheelchair has not yet arrived. An electronic communication device is also on order. Melvin has partial paralysis on his right side and is just beginning to learn to use his left hand for fine motor activities including writing.

Melvin is taking regular classes. His tutor companion is a young woman who was recently divorced and needed to work. She resents the low wages and isn't wild about kids but she had experience as an LPN before letting her certificate expire. The principal thought her medical background could be useful if Melvin experienced any further complications from the stroke. The school had also had a difficult time finding a tutor companion to work with Melvin because he is in advanced classes in high school. They needed someone who could understand and interpret the curriculum for him.

Victoria is always punctual but often stops by the teacher's lounge before going to the school bus stop where she is to meet Melvin every morning. Melvin often comes into homeroom late. During English class last week, the teacher had to ask Victoria to not file her nails in class. In History class, the teacher reported Victoria was reading a Harlequin novel. In the middle of the Science lecture on human anatomy, Victoria was swinging her leg, and tapping her fingers. Finally, she stood up and announced Melvin had to go to the bathroom and wheeled him out of the room even though Melvin seemed to be protesting. Several times, Victoria has been seen in the halls chatting with friends while Melvin was pushed up against the wall.

**CHALLENGE**
You can't fire her but you do need to develop some strategies to help Victoria work more cooperately toward Melvin's best interests.

# Vignette 11

Robert is non-verbal and autistic. He has strong acting out behaviors. Two years ago, Robert's parents attended a seminar on facilitative communication. They immediately convened a child study team at the school and insisted Robert's teacher and aides be trained in the process and that it be instituted with Robert immediately.

Research on facilitative communication has been mixed. There have been both emotional success stories and a lot of skepticism, but the principal decided that it was worth a try. Three educators were sent for training and they began using the strategy with Robert. After two years, Robert still needs hand-over-hand intervention to type any communication. The teacher feels that Robert has not progressed significantly since he still needs physical assistance to communicate. The aid swears that Robert is doing all the typing/communicating. She swears she is just giving Robert's arm support and that she is not directing the selection of letters.

The other day, the teacher asked Robert some very specific questions about his week-end. The aid had not had the opportunity to talk to the parents that morning. Robert's answers were mumble jumble. The aid said that Robert was tired.

Today, the teacher asked Robert what he wanted for lunch. With the aid's assistance, Robert typed hamburger, fries, milk and cake. The aid did not know that Robert's parents had ordered pizza for the whole class for lunch.

To be fair, there are times you feel Robert is engaging in some communication but it is very seldom. Most of the time he seems to respond more to the patterning of the communication activity. The aid however, is telling everyone, including the parents, what wonderful progress Robert is making.

**CHALLENGE**
The parents believe that the aid is correct. They feel Robert is really beginning to communicate. They feel Robert is very bright and is capable of doing grade level work. They are talking about mainstreaming Robert in one class to see how he does. A child study team meeting is scheduled for next week to identify new goals and objectives for Robert.

## Vignette 12

Michael is Gifted. He has a tutor companion because he has muscular dystrophy. He recently lost much of the strength in his forearms and wrists and writing is now a difficult and tiring task for him. Michael has a computer with macros, word prediction and other rate enhancers, but the system is still too slow for him to take notes in class or complete a test during the period so Michael dictates answers and relies on the tutor companion to take notes.

Michael's tutor companion enjoys going to class with Michael. The two have a good repore and are very congenial. The tutor companion, however, is very competitive. She has complained about the slowness of the computer. She is uncomfortable with Michael turning in assignments late because he has to finish them in study hall. When several teachers made comments about Michael not getting his work done, she decided she would write all of Michael's written work in class.

Yesterday, Michael had a lab in Science. A great deal of writing was required to answer all the questions based on the lab work. The teacher observed that the aid was sitting at the lab table writing furiously while Michael's wheelchair was positioned to the left and behind the aid's chair. Michael sat quietly looking off into space. Later, the teacher asked the tutor companion how Michael had done on the assignment. "Oh, we worked so hard. We really had a time with that lab assignment. We barely finished it in time."

**CHALLENGE**
Comments made by the aid indicate that she truly believes Michael is doing all the work and that she is only assisting, but observation says the aid is doing the work and only occasionally including Michael in the process.

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## VENDORS

**Action Mobility Products & Services, Inc.**
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Lake Worth, FL 33461
[Safety Rehab Tray, Stabilizer Bracket]

**Adaptive Communication Systems, Inc. (ACS)**
P O Box 12440
Pittsburgh, PA 15231
1-800-247-3433
FAX (412) 264-1143
[DAC, ]

**Adaptive Consulting Services, Inc. [ACS]**
**Dr. Steven Ray**
253 Merritt Square Mall, Suite 642
Merritt Island, FL 32952
(407) 639-7116
[DynaVox, Don Johnson distributor,

**American Thermoform**
2311 Travers Avenue
City of Commerce, CA 90040
(213) 723-9021
(800) 331-3676

**Apple Corporation**
check with your local or regional agent

**Blazie Engineering**
105 E. Jarrettsville Road, Unit D
Forest Hill, MD 21050
(410) 893-9333
[Baille n' Speak, Braille Blazer, BEX software, Duxbury software, Hot Dots, Mega Dots, ASAP]

**C.J.T. Enterprises**
3625 W. MacArthur Blvd., Suite 301
Santa Ana, CA 92704
714) 751-6295
[Walk It-for mobile AAC users]

**Computer City [formerly Tandy/Radio Shack]**
check with your local vendor
[laptop computer, dot matrix printer]

**Computer Curriculum Corporation [C.C.C.]**
1442 N. Farwell Avenue, Suite 605
Milwaukee, WI 53202
(800) 325-6112

**ComputerLand**
5747 N. Andrews Way
Ft. Lauderdale, FL 33309-2364
(800) 226-0324
[harddrive, software]

**Don Johnston Developmental Equipment**
1000 N. Rand Road, Bldg. 115
P O Box 639
Wauconda, IL 60084
1-800-999-4660
[Storytime software, Gateway Stories]

**Exceptional Computing**
450 N. W. 58th Street
Gainesville, Florida 32607
[Penta Switch]

**Glencoe Division of Macmillan/McGraw-Hill**
936 Eastwind Drive
Westerville, Ohio 43081
[Typing for the Physically handicapped by Jack Heller]

**Hartley**
3001 Coolidge Road, Suite 400
East Lansing, MI 48823
(800) 247-1380
[Brick by Brick software]

**Laureate**
110 E. Sprint Street
Winooski, VT 05404
(800) 562-6801
[Sentence Master software]

**Lighthouse for the Blind of the Palm Beaches [vendor]**
**[Beecher Research Company - sole manufacturer]**
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(407) 586-5600
[Beecher Mirage Binocular]

**Low Vision Aids, Inc.**
1375 Progresso Drive
Ft. Lauderdale, FL 33304
1-800-535-9968
[Reading Edge]

**Micro Video**
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P O Box 7357
Ann Arbor, MI 48107
(313) 996-0626
1-800-537-2182
[Video Voice]

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Wilmette, IL 60091
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[Tiny Talk]

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**Raise Dots**
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[Raised Dots, Mega Dots,

**Sammons, Inc.**
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Western Springs, IL 60558-0386
[Electric Self-Feeder]

**Scholastic**
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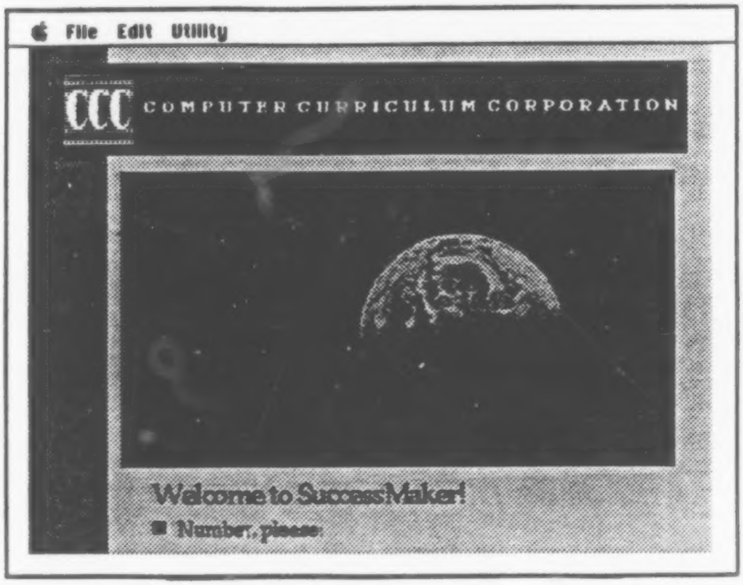
Jefferson City, MO 65101
(800) 541-5513
[WiggleWorks, and other software]

**Sentient Systems Technology**
2100 Wharton Street, Suite 630
Pittsburgh, PA 15203
(412) 381-4383
[DigiVox, DynaVox, DynaWrite Software]

**Words+**
P O Box 1229
14421 10th Street W., Suite 1
Lancaster, CA 93584
[Scan and Morse Code Keyboard Emulator Software, EZ Keys]

# Welcome to SuccessMaker

## Sign On



Welcome to SuccessMaker!

■ Number, please:

Number ____
First Name ____

## Keyboard

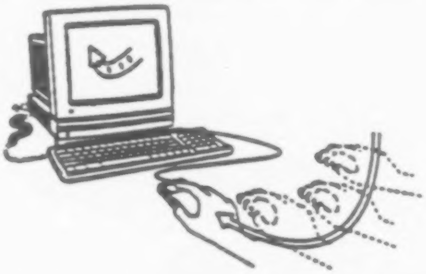
Press Return or Enter to answer.

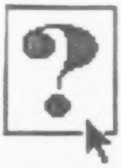
Press Delete or Backspace to erase.

Hold down Shift and press a letter key to type a capital letter.

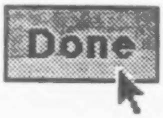
## Mouse

Move the mouse to move the pointer on the screen.

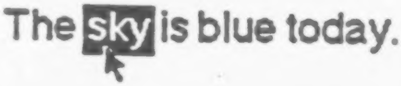




Move the pointer to an object. Then press the mouse button to click on it.



Click on the DONE box to see the next exercise.



The sky is blue today.

Move the pointer to a word to highlight it. Click on a highlighted word to choose it for an answer.

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# Math Concepts and Skills (MCS)

### Level

Grades K-8/Adult

### Course Length

310 hours (9 years of daily 15-minute sessions)

### Purpose

*Math Concepts and Skills* is a comprehensive course on fundamental mathematics. Appealing graphics are used to demonstrate mathematical concepts and sharpen problem-solving skills. Audio instructions and feedback reinforce the learning process in grades K through 2.

### Content

The course is divided into 16 content areas, or strands, containing more than 1,410 skills typically taught in kindergarten through the eighth grade.

The mathematical concepts and skills presented in the course are distributed among computation and application strands as follows:

- *Computation strands:* Addition, Subtraction, Multiplication, Division, Fractions, Decimals, Equations, and Speed Games

- *Application strands:* Number Concepts, Geometry, Measurement, Word Problems, Applications, Problem-Solving Strategies, Science Applications, and Probability and Statistics

### Features

*Math Concepts and Skills* provides students with several tools and resources:

- *Tutor* presents general tutorials that give instruction or provide an example of how to work a particular type of exercise.

- *Toolbox* includes rulers, protractors, and a calculator, available for all appropriate exercises.

- *Glossary* provides definitions for 182 mathematical terms.

- *Help* completes the current exercise as an example.

- *Audio Repeat* enables the student to hear the last message again.

- *Student Report* provides an easily understood representation of the student's performance in the current session.

- *Worksheets* can be printed based on student needs or teacher selection.

# Problem Solving (PS)

### Level

Grades 3-6

### Course Length

100 hours (4 years of daily 10-minute sessions)

Purpose

To develop the practical math skills needed to solve word problems.

### Content

The course is divided into seven strands of different types of word problems: How Many; Money; Mystery Numbers and Age; Measure; Number Systems; Geometry; and Time, Rate, and Distance.

### Features

- In some exercises, a *calculator* feature allows students to do computations quickly so they can focus on problem-solving strategies.

- Detailed tutorial explanations help students learn strategies for solving word problems.

- Students find the answer and also identify how they got the answer to build understanding.

- Students who are doing well are challenged with problems of greater difficulty.

# Reading Readiness (RR)

## Level

Grades K-1

## Course Length

35 hours (1year of daily 7-minute sessions)

## Purpose

This course prepares children for formal reading instruction.

## Content

*Reading Readiness* builds language and conceptual skills at prereading levels. It develops 36 essential reading readiness skills. Exercises are divided into six instructional strands: Letter Identification, Visual Discrimination, Auditory Discrimination, Vocabulary Building, Comprehension Skills, and Special Activities. The topics were chosen to appeal to children under age eight, and the pictures used are easily identifiable by children of all cultural backgrounds.

## Features

- All exercises include color illustrations as central elements in instructional presentations.

- Extensive use of digitized speech for instruction and reinforcement helps children build a solid foundation for reading.

- A review feature is automatically activated if a student has difficulty.

- Color graphics make the learning activities interesting to students.

# Initial Reading (IR)

## Level

Grades 1-2

## Course Length

60 hours (2years of daily 10-minute sessions)

## Purpose

To help young students develop a foundation in reading skills.

## Content

The course develops comprehension and vocabulary skills. Exercises are organized into six instructional strands: Letter Identification, Patterns (including phonics and structural analysis), Sight Words, Word Comprehension, Sentence Comprehension, and Passage Comprehension. The content and exercise formats are based on materials and tests commonly used in school reading programs. Initial Reading fits into te reading curriculum between Reading Readiness and Reader's Workshop.

## Features

- The student uses the computer mouse to answer multiple-choice exercises; typing is limited to letter identification, sight-word practice, and single-word responses.

- Students have access to three online resources: Audio Repeat, Help, and a Student Report.

- Spoken instructions and tutorial messages give audio support to the beginning reader.

- Colorful, interactive games and other reading activities begin and end each session.

- Brightly colored, appealing animal characters and animations help to motivate young learners.

- Comprehension exercises include colorful illustrations.

- Individualized review of difficult exercise supports the student who needs additional practice.

# Reader's Workshop (RW)

### Level

Grades 3-7/Adult

### Course Length

120 hours (4 years of daily 10-minute sessions)

### Purpose

To develop basic reading comprehension with an emphasis on higher-order thinking skills.

### Content

Two strands, Passage Comprehension and Thematic Lessons, develop integrated and content area reading skills. Five additional strands contain exercises that develop and apply specific skills to a variety of reading contexts: Word Analysis, Word Meaning, Literal Comprehension, Interpretive Comprehension, and Reference Skills.

### Features

- Color, graphics, and animation bring reading activities to life.

- Answer selection using the mouse lets students focus on content, not on typing.

- Student resources, which include a student report, a glossary, and a help option, promote self-directed learning.

- Tutorial messages guide students during exercises in the two integrated reading strands.

- The thematic lessons use a directed reading-thinking approach to teach students to analyze text, interpret informational graphics, and integrate vocabulary and comprehension skills.

- Individualized worksheets can be printed for additional practice, and lesson-based writing activities in the teacher's handbook can be used as supplementary assignments.

- Reports give teachers diagnostic information on a student's areas of difficulty.

# Reading Investigations (RI)

### Level

Grade 6/Adult (Grades 7 and 8 will be added in the next release.)

### Course Length

36 hours (1 year of three 20-minute sessions a week)

### Purpose

*Reading Investigations* invites students to turn detective and discover meaning in materials from three content areas: literature, science, and social studies. Students build comprehension and thinking skills in reading both fiction and nonfiction, develop a variety of reading strategies, and build their vocabularies.

The course extends the reading experiences with writing activities using an online notebook. Music accompanies reading passages, and audio is used for hints, answer messages, and pronunciation of glossary words. *Reading Investigations* allows teachers the flexibility to structure the course by theme, strategy, or content area to meet instructional needs or teaching preferences.

### Content

The course contains three types of lessons:

1. *Literature-based lessons* feature selections from award-winning fiction and nonfiction books. These lessons are designed to help students develop reading, writing, and thinking abilities.

Examples:

- Black Star, Bright Dawn
  by Scott O'Dell

- The Indian in the Cupboard
  by Lynne Reid Banks

- My Side of the Mountain
  by Jean Craighead George

- Lost Star: The Story of Amelia Earhart
  by Patricia Lanber

- Secret of the Andes
  by Ann Nolan Clark

# Language Arts Strands (LS)

## Level

Grades 3-6

## Course Length

100 hours (4 years of daily 10-minute sessions)

## Purpose

To develop skills in correct language usage through contextual practice, rather than rules.

## Content

The course is organized into eight strands: *Principal Parts of Verbs; Verb Usage; Subject-Verb Agreement; Pronoun Usage; Contractions, Possessives, and Negatives; Modifiers; Sentence Structure; and Mechanics.*

## Features

- Students learn by examples, patterns, and practice.
- Additional exercises provide extra practice for students who need help in a particular area.
- Error analysis distinguishes certain spelling or mechanical errors from content errors.
- Individualized worksheets can be printed for additional practice.

# Writer's Express (WE)

## Level

Grades 3-6

## Course Length

25 hours (One-half year of daily 20-minute sessions)

## Purpose

To develop writing skills through a series of process-based assignments that promote analytic and creative thinking.

## Content

There are 14 modules (assignments), each one divided into four lessons. Each lesson focuses on a phase of the writing process: prewriting, drafting, revising, or checking. The course emphasizes descriptive and narrative writing and introduces expository and persuasive writing as well. Students review usage and mechanics in the context of writing assignments. Sentence-combining exercises challenge students to experiment with language.

## Features

- Syntax manipulation exercises allow students to select words with a click of the mouse and move them into the desired sentence order.
- Colorful illustrations spark the imagination and reinforce the relationship between mental images and language.
- Students use an idea processor *(the Web)* as a prewriting tool to enter and organize their thoughts.
- The word processor has built-in guides and hints to encourage students to think creatively about the topic.
- Special instruction windows help students write and revise their stories.
- A spelling checker helps students identify misspelled words.
- The word processor and Web can be used independently of the instructional lessons for other assignments or student-selected work.

# Spelling Skills (SPS)

## Level

Grades 2-8/Adult

## Course Length

175 hours (7 years of daily 10-minute sessions)

## Purpose

*Spelling Skills* helps students achieve spelling mastery by combining practice, quizzes, and games. It is based on two important assumptions:

1. Practice is a more effective way to learn spelling than memorization of abstract rules.

2. Spelling practice is most efficient when it is focused on individual student needs.

*Spelling Skills* introduces rules and patterns as students study the words they don't know. Words are arranged in over 60 groups such as homophones, words ending in double consonants, and adjectives with suffixes. This enables students to make generalizations about rules and develop generally applicable strategies for learning new words.

## Content

The core of *Spelling Skills* is a list of 3,200 words selected from:

- Lists of frequently misspelled words

- Lists of words frequently encountered in reading and writing

- Spelling activity workbooks

- Spelling portions of standardized achievement tests

- Vocabulary lists from other SuccessMaker courses

## Features

- The course is individualized to each student, so students only spend time studying words they don't already know.

- Word study exercises focus on difficult portions of words, pronunciation, syllabification, and use of words in context.

- Individualized tutorial hints support the student

- Teachers can use enrollment options to create focused activities such as review quizzes, fixed-unit drill, or games only.

# Keyboard Skills (KS)

## Level

Grades 4-12/Adult

## Course Length

10 hours (One-half year of daily 10-minute sessions)

## Purpose

To develop speed and accuracy in typing. Provides practice with numbers, special character keys, and keys specific to a computer keyboard so that students become comfortable using them. Prepares students for SuccessMaker courses that require typing, such as *Writer's Express* and *Writing: Process and Skills*.

## Content

Beginning with the home-key hand position, the course gradually introduces the position and function of each key. After a series of instructional exercises, students practice using new keys as they play an arcade-style game. The Word Bank stores separate lists of practice words to be used in the games, making the course flexible and useful for a wide range of grade levels and special interests.

## Features

- Students can choose from a menu of entertaining games designed to develop specific skills. The games motivate students, challenging them to improve their highest score.

- Teachers may specify a list of practice words for each student, adding words from classroom work.

- Tests for speed and accuracy are given at regular intervals.

- Diagrams illustrating proper hand position are displayed on the screen.

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2. *Strategy lessons* show students how to become more proficient readers. For example, students are shown how to understand different text structures, analyze character, and use structural analysis to unlock word meanings.

3. *Vocabulary exercises* build reading and vocabulary skills while developing students' abilities to use context clues.

### Features

- Flexible enrollment options put the teacher in control of lesson planning. Teachers can create thematic units, strategy applications units, or units with a focus on literature, science, or social studies. They can also assign students specific lessons or let the students choose their own paths through the course.

- Students benefit from several online tools and resources, including a glossary, a notebook, a footnote function, and a magnifying glass that gives them access to hints during reading.

- Course includes a Presentation Guide for classroom activities.

## Practical Reading Skills (PRS)

### Level

Grades 5-8/Adult

### Course Length

25 hours (One-half year of daily 15-minute sessions)

### Purpose

To develop functional reading skills with practical everyday materials, including reference sources, charts, maps, schedules, menus, labels, advertisements, posters, directions, and applications.

### Content

The 51 lessons in the course are organized in eight modules: *Introduction, Entertainment, Health and Nutrition, Information Sources, Transportation, Consumer Skills, Study Skills,* and *Competency Tests.* Most lessons include three sections: building vocabulary, practice, and review exercises. The course integrates computer instruction with reading from a student text.

### Features

- Competency tests evaluate the student's ability to apply practical reading skills in a testing situation.

- Tutorial messages guide students to the correct answer.

- Backup exercises are available for more practice.

- The text contains illustrated reading materials and a glossary.

- A printed checklist helps students to monitor progress.

# PROCEDURES FOR THE PLACEMENT OF ADAPTIVE/ASSISTIVE EQUIPMENT FOR STUDENTS WITH DISABILITIES

**Philosophy: The assignment of adaptive/assistive technologies to a student, implies that the hardware/software is essential for a student to realize his/her optimal potential in environments, as defined by district policy, and that the potential success of the student is diminished by the absence of this equipment.**

The process for selecting and placing adaptive/assistive technologies should reflect, at a minimum, the following:

Increased independence

Improved quality of life

Increased productivity

Enhanced performance

Expanded educational, vocational and community options

Increased least restrictive environment placement

Reduced amount of support services needed

**Definition: The application of adaptive/assistive technology involves awareness, assessment, identification appropriate solutions, training, practice, skilled professionals from multiple disciplines, follow-up, support, and maintenance. The technologies employed are perceived as a *means* rather then an end in itself.**

The broader definition of adaptive/assistive interventions can affect one or more of the following areas:

Altering skills or task sequences for the individual student

Altering rules or procedures in individual situations

Providing instructional prompts

Altering environmental conditions

Altering social and attitudinal factors

Developing or selecting adaptive/assistive technologies

Procedures for the Placement of Adaptive/Assistive Equipment for Students with Disabilities
School Board of Palm Beach County, Department of Exceptional Student Education

A variety of tactile, auditory, motor, and visual materials and equipment are included in the definition of adaptive/assistive technologies. These include, but are not limited to:

- abacus
- auditory trainers
- beep balls
- braille writers
- braille printer
- calculators
- closed captioning
- communication boards
- computers
- illumination devices
- large print materials
- mats
- magnification aids
- optical aids
- projection aids
- reading machines
- record players
- screen readers
- scanning aids
- sensory kits
- speech synthesizers
- tachistoscopes
- tactile stimulations
- talking book machines
- talking calculators
- tape recorders
- telebraille devices
- televisions
- thermoform machines
- typewriters

## Legislative History:

Section 504 of the Rehabilitation Act of 1973 prohibits discrimination against qualified handicapped persons, thereby ensuring them of an equal opportunity to participate in and benefit from programs and activities receiving Federal financial assistance.

Section 504 defines a "handicapped individual" as any person who has a physical or mental impairment which substantially limits one or more major life activities.

The Education of the Handicapped legislation, P. L. 94-142 (1975) was amended in 1990 by the Individuals with Disabilities Education Act (IDEA), P.L. 101-476. IDEA states "that schools must ensure that special equipment is available to a disabled child if that child requires assistive-technology devices, or services, or both in order to receive a free, appropriate education" (FAPE). The law further states that the services and equipment can be provided "either as special education, related services, or as supplementary aids and services that enable a child with a disability to be in regular classes." The definition requires the existence of an Individual Education Plan (IEP) which identifies the supplementary or related services used with a student.

Part A of IDEA defines assistive / adaptive devices as equipment or systems "used to increase, maintain, or improve the functional capabilities of children with disabilities" and defines assistive technology services as those which "...directly assist an individual with a disability to select, acquire or use an assistive technology device." (Section 1401.25 and 26)

Part B of the Education of the Handicapped legislation's least restrictive environment (LRE) provisions require each agency to ensure "that special classes, separate schooling or other removal of handicapped children from the regular educational environment occurs only when the nature or severity of the handicap is such that education in regular classes with the use of supplementary aids and service cannot be achieved satisfactorily."

**Prerequisite Criteria:**

A. The student must have a current Individual Education Plan (IEP).

B. The student must be between the ages of 3 and 21 years of age.

C. The ESE District Technology Committee reviews referrals on a case by case basis. For review, the Committee needs the following:

   1 ) Documentation of the student's current unmet need(s)

   2 ) Documentation and description of the specific barrier(s) which can be ameliorated or minimized by the use of adaptive/assistive technology

   3 ) Documentation of the student's present abilities and consideration of these abilities in relationship to use of a specific type of adaptive/assistive technology

   4 ) Documentation of specific objectives, goals and plans for using the adaptive / assistive technology to integrate the student into different environments

## Screening, Evaluation and Referral:

A. The student is referred to the school-based Child Study Team (CST) by any of the following personnel:

1 ) School Administration
2 ) Parent
3 ) Teacher
4 ) Other

B. The school-based Child Study Team will discuss the referral considering the following:

1 ) Current academic level of functioning
2 ) Current communication ability
3 ) Types of services/personnel involved with student:

   a ) Speech/Language Impaired
   b ) Occupational Therapy/Physical Therapy
   c ) Physically Impaired
   d ) Hearing Impaired
   e ) Visually Impaired
   f ) Medical
   g ) Orientation Mobility
   h ) Adaptive Physical Education
   i ) Current status of other handicapping conditions
   j ) Student's placement in ESE/Regular classroom
   k ) Program/Resource Teacher
   l ) Educational Interpreter
   m ) Techology Specialist

4 ) Need for additional information or ESE placement procedures

C. The school-based Child Study Team will request a student evaluation for adaptive/ assistive technologies by a Multidisciplinary Team. The Multidisciplinary Team will include personnel from the various disciplines involved with the child in order to determine as much as possible the:

1) Educational need for adaptive/ assistive technologies
2) Selection of the most appropriate adaptive/ assistive technologies

NOTE: For Augmentative procedures, refer to the Augmentative Assistive Communication (AAC) guidelines in the Speech Language Interventions section of the Special Programs and Procedures.

D. The school-based Child Study Team will document in writing the request for a student evaluation. The documentation should specify the:

1) Nature of the request(s)
2) Current ESE program placement(s)
3) Current performance level of the student in reading, writing, math etc.
4) [illegible] by the Child Study Team to enhance the student's educational program
5) Date of request
6) Members of the Child Study Team

E. The written documentation should be sent to the:

1) Principal of the school
2) Area Office Instructional Team Leader
3) ESE District Technology Committee

## Evaluation for Adaptive/Assistive Technology

[illegible]

[illegible]

1) Physical Therapist - positioning, range of motion, medical considerations, switch selection
2) Occupational Therapist - range of motion, switch selection, physical orientation/mobility, implementation and integration of device into daily routine
3) Speech/Language Pathologist - speech input and/or output, appropriate software
4) Educator - input and output selection, visual orientation/mobility, software selection, curriculum integration
5) Technology Specialist - hardware selection, software selection, adaptive/ assistive technology selection

A. The Multidisciplinary Team can use the ESE District Technology Committee Checklist as a guideline.

B. The Multidisciplinary Team will summarize their findings in a written report that is submitted to the ESE District Technology Committee. The report will include:

1) Collection and analysis of pertinent background information
2) Observation(s) of user in environmental context(s)
3) Assessment of user's skills
4) Systematic investigation of access device variables

    a) input selection
    b) output selection
    c) screen presentation

5) Environmental considerations
6) Rationale for recommending or not recommending adaptive/ assistive technologies
7) If recommended, a list of suggested adaptive/assistive technologies
8) The recommendation for technologies should include:

    a) software required to effectively integrate the technologies into the educational program of the student
    b) provisions that enable the receiving classroom to accomodate student's adaptive equipment
    c) supplies needed to support the technologies*

*NOTE: Initial consumable supplies for equipment are provided when the item is placed. Additional supplies are the responsibility of the school.

## [illegible]

[illegible]

A. [illegible]

B. A consensus of the ESE District Technology Committee member(s) will determine the appropriate action(s) which could include:

1 ) Approval
2 ) Denial of request
3 ) Identification of funding source
4 ) Request for additional documentation
5 ) Other

C. Notification of the action will be sent to the school-based Child Study Team and Area Instructional Support Team.

D. The ESE District Technology Committee will designate the committee member(s) who will do the following tasks as needed:

1 ) Send the approval/denial letter to the Principal and Area Instructional Support Team
2 ) Initiate the requisition for a purchase order
3 ) Be responsible for procuring a property record tag
4 ) Inventory the devices
5 ) Place and install the technologies
6 ) Position the student appropriately
7 ) Write an Implementation Plan
8 ) Provide technical assistance and training of personnel involved with the student and the technologies as requested by the school-based Child Study Team
9 ) Monitor and follow-up implementation and integration of the technologies

E. The Principal of the school will

1 ) Have the technical device listed on the school inventory
2 ) Ensure opportunities for training of school-based staff will be provided as needed

F. The school-based Child Study Team, in collaboration with staff from the Area Instructional Support Team, the Department of Exceptional Student Education, and/or the Department of Adult, Vocational, and Community Education will do the following tasks as needed:

1 ) Document the student's current unmet need(s)
2 ) Document and describe the specific barriers which can be ameliorated or minimized by the use of assistive technology
3 ) Document the student's present abilities and consideration of these abilities in relationship to use of a specific type of assistive technology
4 ) Initiate the request for an observation of a student who might benefit from a technical device
5 ) Document specific objectives, goals, and plans for using the assistive technology to integrate the student into different environments
6 ) Identify the person(s) on site, who will be responsible for implementing the goals and objectives and for integrating the technology into the student's daily operations
7 ) Identify the person(s) who will be responsible for the care and operation of the equipment
8 ) Determine the depth of training needed and the personnel, including the student, who need to be trained
9 ) Designate a school-based case manager who will serve as the primary contact person if
    a) equipment needs repair
    b) additional training is required on the hardware or software
    c) technical assistance is needed
    d) suggested implementation strategies are needed
    e) questions pertaining to the Individual Education Plan or the Implementation Plan need to be addressed
    f ) there is a need for further evaluation on access issues or selected technology

## Placement of Technologies

A. The placement of an adaptive / assistive device(s) with a student in must be embedded in the goals and objectives of the student's educational program and therefore, requires a revision of the student's Individual Education Plan (IEP). [See section on IEP]

B. A person, designated by the ESE District Technology will work with the Child Study Team to write an Implementation Plan indicating the intended outcome expected by the placement of the equipment. One copy of the Implementation Plan will stay at the school; one copy will be sent to the Area Instructional Support Team, and one copy will be sent to the ESE District Technology Committee.

C. The initial Implementation Plan should reflect the goal or rationale used to place the equipment. Short term objectives should include the skills needed by the student to effectively use the technologies. The objectives should be measureable as specified in the criteria. Examples of short term objectives might include:

- -The student will learn the arrangement of the keys on the QWERTY keyboard within 9 weeks.
- -The student will use a prompt sheet to learn Morse Code. As the student becomes familiar with the code for a letter or number, that portion of the prompt sheet will be covered until the prompt sheet is no longer needed by the student. The student should demonstrate competency in Morse Code by the end of one semester.
- -Within 9 weeks, the student will learn to open and create a new file, then save the file using the features of his/her word processing software.
- -Within 9 weeks, the student will learn to independently activate the word prediction and/or alphabet scan and to use that software feature to compose original text.

C. One responsibility of the Multidisciplinary Team is to assess environmental considerations, problems and barriers. When technology is placed, these concerns should be re-evaluated and modified as needed.

1 ) Identify all environments in which the device will be used

2 ) Identify the intended application(s) of the device

- a ) classroom work
- b ) socialization
- c ) recreation
- d ) vocational classes
- e ) independent living
- f ) special activities

3 ) Identify critical device features, such as

  a) portability
  b) weight
  c) ease of operation
  d) safety
  e) maneuverability

D. The school-based Child Study Team will determine the training needs and levels for the following:

1 ) Regular educator
2 ) ESE educator
3 ) Special Needs Assistance Program (SNAP) educator (Grades 6-12 only)
4 ) Aide
5 ) Student
6 ) Parent

Initial training, which occurs when the equipment is placed, is generally brief and functional in nature. If greater, in depth training is needed, the Child Study Team should contact the Principal of the school to make arrangements to meet the training needs. Indepth training can be arranged through the Area Instructional Support Team, the Department of Exceptional Student Education (ESE), the Florida Diagnostic and Learning Resource System (FDLRS/Alpha), or the Department of Adult, Vocational, and Community Education.

A matrix of training levels is provided in Chart A as a guide to assist the Child Study Team in determining inservice needs. The matrix is not intended to be a comprehensive list of all the skills needed to select, install, maintain, integrate and trouble shoot technical devices. It is a guide to some of the increasingly difficult skills, required by different personnel, to adequately provide technical assistance to technology users.

Those who work directly with a student who is using technology, need to function at least on level 2 or 3, depending upon the device. It is appropriate to note that research supports the fact that training is required to ensure successful application and integration of technology with individual students or groups of students.

## Individual Education Plan (IEP)

A. The Implementation Plan is a support document but is not part of the IEP.

B. If adaptive/assistive equipment is placed with an individual student, the goals and objectives of the IEP must be revised to reflect the use of the device(s) and any new service(s) associated with the placement.

C. AFTER the student has been assigned adaptive/assistive technologies, the SKILLS required to operate the equipment can be referenced in the IEP.

D. If a student is mainstreamed for the entire day, reference to adaptive/assistive devices should be made in the sub-section "Special Aids, Services or Equipment" in the section headed PARTICIPATION IN REGULAR OR VOCATIONAL PROGRAMS(S). These sections are found on the last page of the IEP form.

E. Reference to adaptive/assistive devices, needed for modification of ESE or Regular curriculum, should be made in the box headed MODIFICATIONS. This section is found on the last page of the IEP form.

F. If the student uses adaptive/assistive devices in both ESE and regular classes, reference to the devices should be made in both sections of the IEP outlined in (D) and (E) above.

G Specific brand names of adaptive/assistve devices should not be listed in the IEP. For example, use "computer" rather than "Tandy Laptop 2820" or use "word prediction" rather then "EZ Keys."

H. Students who are fully or partially mainstreamed with the support of adaptive/assistive technologies and other support services are eligible for the Double Basic Cost Factor.

The sub-section "Qualified for Mainstream Cost Factor" of the section PARTICIPATION IN REGULAR OR VOCATIONAL PROGRAM(S), needs to be completed and documentation needs to be maintained.

## Vocational Adaptive/Assistive Technologies

A. The Department of Exceptional Student Education works cooperatively with the Department of Adult, Vocational, and Community Education to service the needs of secondary ESE students. Specialized adaptive equipment has been used to teach students pre-vocational skills that will assist the student in the transition to the work force.

B. To take advantage of these opportunities, the Child Study Team, ESE Contact Person or SNAP teacher must notify the Department of ESE or the Department of Adult, Vocational and Community Education of the intent to schedule a student into a vocational course so that ample preparatory time is available to determine the technical adaptations needed by the student. The SNAP teacher, now functioning in most middle and high schools, can also facilitate this process.

C. ESE students mainstreamed into Vocational Classes earn special funding. Documentation of their placement and the services offered to support the student in the Vocational class is necessary to generate 316 funding.

## Follow-up

A. The Child Study Team may request technical assistance and support or inservice training from the Area Instructional Support Team, the Department of Adult, Vocational and Community Education and/or the Department of Exceptional Student Education any time there is evidence of a need. The following circumstances are examples of specific times technical assistance may be required:

1 ) During the school year, a new teacher begins to work with the student and equipment;

2 ) A new instructional aide and/or tutor companion is hired; and

3 ) The student transitions to a new grade level or school and gets a different teacher(s).

B. As the student advances in age and grade level, his/her needs may change. The Child Study Team should annually review the Implementation Plan and IEP to determine:

1 ) If the Implementation Plan is realistic and appropriate for the educational needs of the student;

2 ) If the Implementation Plan is being integrated into the educational program of the student;

3 ) If the Implementation Plan needs to be revised to reflect improved skills and capabilities demonstrated by the student;

4 ) If the technologies in place are meeting the educational needs of the student;

5 ) If the technologies may need to be upgraded in memory or capability;

6 ) If another system may be needed to meet the educational needs of the student;

7 ) If the student can succeed academically in the mainstream with the available adaptive/assistive devices; and

8 ) If the student is making adequate progress academically and/or socially through use of the technologies.

## Ownership of adaptive/assistive technologies

A. The majority of the technologies purchased through funding from P.L. 94-142 and P.L. 89-313 are assigned to a student. The technologies will follow that student from one school to another unless one or more of the following conditions occurs:

1 ) The student moves out of the district;
2 ) The technology no longer meets the educational goals of the student and different solutions need to be considered;
3 ) The technology is damaged beyond repair; or
4 ) The equipment is assigned to a unit (e.g., VI unit or HI unit) rather than the student

B. The technologies assigned to a specific student or ESE unit are transfered to the school the student attends for inventory tracking purposes.

The equipment will appear on the school's equipment inventory list printed by the Department of Regulatory Compliance. The technologies however, remain the property of the Department of Exceptional Student Education and are tracked by the ESE District Technology Committee.

C. If a student, who is assigned adaptive/assistive technologies, is transferred to another school in the district, the original school should immediately notify the Department of Exceptional Student Education. A person will be assigned to pick up and transfer the equipment and initiate the TRANSFER OF PROPERTY FORM, PBSD 0082.

D. If a student, who is assigned adaptive/assistive technologies, is transferred to another school out of the district, or if said student graduates from a school in the District, the original school should immediately notify the Department of Exceptional Student Education. A person will be assigned to pick up the equipment and initiate the TRANSFER OF PROPERTY FORM, PBSD 0082.

If still usable, the equipment will be reassigned to another student at the discretion of the ESE District Technology Committee.

E. Some adaptive/assistive devices may be needed in the student's home environment so that a student can complete homework assignments. A student may transport assigned equipment home for homework purposes if the:

1 ) Principal of the school approves the student's use of the equipment both at home and at school; and

2 ) Student and parent(s) and/or guardian(s) demonstrate reliability in transporting the device back and forth between the school and home environment.

## Repair / Replacement of Adaptive/Assistive technologies

A. If the technologies are damaged or broken through use, the school is responsibile for filling out the WORK ORDER form (PBSD0443) and submitting it to Maintenance and Plant Operations to initiate the repair of the equipment. This particularly applies to:

1 ) Tandy/Computer City computers and printers
2 ) IBM computers and printers
3 ) Apple Corporation computers and printers

However, specialized equipment may require contracting the repair with the manufacturer of the device. In such cases, the school should contact the Department of Exceptional Student Education, who will, in turn, handle the repair of the equipment. Specialized equipment includes, but is not limited to:

1 ) braille printer
2 ) Braille n' Speak
3 ) Echo Speech Synthesizer
4 ) Adaptive Firmware Card / Ke:nx
5 ) Switches
6 ) Power Pad
7 ) Muppet Learning Keys
8 ) Unicorn
9 ) EZ Key
10 ) DynaVox

B. If the adaptive / assistive technologies are not working properly and the school personnel are not sure what is causing the malfunction, the school should immediately contact the Department of Exceptional Student Education and request technical assistance.

REMEMBER: Assignment of adaptive /assistive technologies to a student implies that the hardware/software are essential to the educational program of that student and that the potential success of the student is diminished by the absence of the equipment.

## Changing Schools

A. When a student transitions from one level of school to another, the procedures mentioned in Ownership of Adaptive/Assistive Technologies go into effect.

B. The educational needs of students change most dramatically between elementary and middle school. Students tend to function in self-contained environments at the elementary level, while secondary students change classes each period. This major change in environments may constitute the need for a re-evaluation of equipment assigned to a student.

The school FROM which the student will transfer, should initiate a request for re-evaluation in the early Spring prior to the end of the school term. This gives ample opportunity for the support personnel to order any new equipment and/or assist the receiving school in preparing the environment for the transitioning student.

## Transition Services

A. Adaptive/assistive equipment assigned to a student will rotate back to the Department of Exceptional Student Education when said student leaves the school system.

B. Adaptive/assistive equipment specifically customized for a student can be disposed of according to a number of alternative including:

1. Rotating back to the Department of Exceptional Student Education.
2. Selling the device to an agency or appropriate personnel at a pro-rated value.

C. Disposal of the customized adaptive/assistive equipment will be determined through the following procedures:

The Florida Statute 274.06 states:

Having consideration for the best interests of the county or district, a governmental unit's property that is obsolete or the continued use of which is uneconomical or inefficient, or which serves no useful function, which property is not otherwise lawfully disposed of, may be disposed of for value to any person, or may be disposed of for value without bids to the state, to any governmental unit, or to any political subdivision as defined in s. 1.01, or if the property is without commercial value it may be donated, destroyed, or abandoned. This is consistent with the CFR guidelines found in section 80.32.

The School Board of Palm Beach County outlines the policy for Property accountability and responsibility in 6.10. This policy is further delineated in the Administrative Directives D6.06. Section 7.11 and 7.12 of the Administrative Directives outline procedures for Liquidated damages and Disposal of School Board land, tangible property, and instructional material.

In a letter dated October 27, 1994, Martha K. Peacock, Supervisor, Grants/Budget Management, Bureau of Student Services and Exceptional Education, Florida Department of Education, clarified the transfer of equipment, specifically assistive/adaptive equipment, when said equipment was originally purchased with grant monies. "The disposition of equipment is addressed in the Terms and Conditions which are attached to every Department of Education project award letter. Paragraph (a) indicates that the equipment in question should be that which is "no longer needed for the original project or program or for other activities currently or previously supported by a federal agency."

Ms. Peacock further stated, "It is a safe assumption to make that equipment specifically designed, selected, prescribed, or otherwise assigned to a student with disabilities, based on an evaluation of that student's needs, would no longer be needed by the program or project when the student leaves that program or project. Likewise, the equipment would not be needed by other activities currently or previously supported by a federal agency, unless the student was transitioning into such an activity. Once you have ascertained that the equipment is not needed as specified above, you may proceed to dispose of it.... Once the determination has been made, it is important to ensure that the property records reflect the disposition of the equipment in accordance with the regulations."

In accordance with the above referenced documents, the ESE District Technology Committee, with approval from the Coordinator of the Department of Exceptional Student Education, can suggest a Staff Report be submitted to the School Board of Palm Beach County recommending that a specific piece of equipment, assigned to a technology-dependent student, be made available to the parent(s) and/or agency who will continue support services after the student has transitioned from a school in the district. Each case will be examined individually to determine the recommended means of disposal for the equipment. Factors that will be considered include, but are not limited to:

technical age of the device
level of dependency on the technology as experienced by the student
level of customization programmed in the technology for the student
impact that withdrawl of technology would have on oral or written communication
the development of an Individual Transition Plan that references post-secondary services
the involvement of the family and/or agency in being able to provide on-going technical assistance and maintenance of the equipment

Equipment that is approved by the School Board of Palm Beach County for disposal in the identified manner, will be submitted to Regulatory Compliance to have the property record number removed from the active file.

A **sample** Staff Report is outlined below:

Staff Report
November 4, 1994

## DISPOSAL OF EQUIPMENT ASSIGNED TO A TECHNOLOGY-DEPENDENT STUDENT

Pursuant to the guidelines in Florida Statutes 2.74, and School Board of Palm Beach County Administrative Directive D 6.06, there exists a need to dispose of a DynaVox augmentative communication system presently assigned to Jane Doe, a senior at Atlantic High School. Jane has a severe form of cerebral palsy. She uses a wheel chair for mobility and the DynaVox for written and oral communication. The DynaVox, property record number A5454, was purchased for use by Jane in 1992 with monies from Project 5441 (I.D.E.A./P.L. 94-142 funds) at a purchase price of $5,500.00.

During the past two and a half years, Jane has customized the DynaVox dictionary with over 400 vocabulary items specific to her personal interests and relations. The DynaVox remains Jane's sole means of oral expression. Without it, she must rely on the ability of her communication partners to interpret her meaning through utterances, facial expressions and body language.

After review by the ESE District Technology Committee on October 16, 1994, Sherle Stevenson, Coordinator, Department of Exceptional Student Education, has recommended draft of a contract to sell the DynaVox, PR# A5454, to the Children's Medical Services (CMS) at the depreciated value of $2,500.00. The contract stipulates that CMS will continue to make the device available for use by Jane Doe following her transition from the public school system of Palm Beach County.

Monies acquires from the disposal of this device will be reinstated in Project 5441 for the sole purpose of buying addition equipment for technology-dependent students.

I recommend that the DynaVox, PR#A5454, be sold to the Childrens Medical Services, at a cost of $2,500.00, for its continued use by Jane Doe and that said property be removed from the active property record file.

Submitted by:

John L. Boyle
Sherle Stevenson (Contact STVENSO)